

PROVENCHERIA

3

Mémoires de l'Herbier Louis-Marie
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FLORA
OF THE
PRAIRIE PROVINCES

A HANDBOOK
TO THE FLORA OF THE PROVINCES OF
MANITOBA, SASKATCHEWAN AND ALBERTA

by

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Part II

Digitatae, Dimerae, Liberae

(Continued)

1. MENTZELIA L.

Stamens numerous, all fertile except sometimes the outer 5.

1. M. decapetala (Pursh) Urb. & Gilg. (Nuttallia decapetala (Pursh) Greene) -- Gumbo-Lily, Evening Star -- A coarse and very rough herb with very large white flowers of 10 petaloid appendages. Stout, erect biennial. Leaves pinnatifid. Petals 5, lanceolate, 3-5 cm long. Stamens 5, about as large and quite similar to the petals. Flowers opening at sunset. Summer. Bare, eroded badlands. -- sMan-sS-sAlta, US, (CA).

Sporadic from the Cypress Hills westward, rather rare further east: Forks of the Red Deer, Roche-Percée and Boissevain.

Order 39. CAPPARIDALES

Like the Rhoadales, but the sepals 4. Ovary unilocular.

70. CAPPARIDACEAE

(CAPER FAMILY)

Leaves trifoliate or digitate. Rather resembling the Cruciferae, but the flower slightly zygomorphous and the capsule devoid of a central partition, often stipitate.

- a. Stamens 8 or more; fruit sessile or short stipitate 1. Polanisia
 aa. Stamens 6; fruit very long stipitate 2. Cleome

1. POLANISIA Raf.

Petals retuse, equal or nearly so, but tending to be deflected toward the upper side of the flower.

1. P. dodecandra (L.) DC. var. dodecandra (P. graveolens Raf.) -- Clammy weed -- A very glutinous herb with trifoliate leaves and stiffly erect pods. Annual. Flowers in bracted racemes, the lower bracts trifoliate, the upper simple. Petals generally less than 8 mm long and the stamens slightly longer, generally less than 10 mm long. Pedicels widely divergent. Mid to late summer. Open sand, sometimes weedy. -- swQ-sS, US -- Var. trachysperma (T. & G.) Iltis -- Flowers larger, the petals at least 6 mm long, the stamens much longer, commonly 10-15 mm long. -- Man-BC, US.

Our two varieties are very weak morphologically and they grade readily one into the other. But geographically they are more sharply segregated than the above distributions would seem to indicate. Only var. dodecandra occurs in the East while in our area all specimens examined, including a Criddle collection at Aweme, belonged to the more western var. trachysperma, except a Marshall collection east of Brandon (DAO) and a Groh collection at Swift Current (DAO).

2. CLEOME L.

Petals entire and somewhat uneven in size. Stamens 6, all of the same size.

1. C. serrulata Pursh (Peritoma serrulatum (Pursh) DC.) -- Stinking-Clover, Spider-Flower -- Capsule very long-stipitate. Generally similar to Polanisia, but not glandular, merely glabrous or puberulent. Flowers pink. Fruit widely spreading to drooping. Early to mid-summer. Sandy soils. -- swQ-BC, US -- F. albiflora Cock. -- Flowers white. -- S, (US).
 Native with us, a rare adventive further east.

Order 40. CRUCIFERALES

A single family with a number of unique features. Distinguished from the related orders by the presence of a central partition in the silique.

71. CRUCIFERAE (CRESS FAMILY)

Flower dimerous with 4 opposite sepals, 4 opposite petals, 6 stamens of which 2 are shorter than the other 4, and 4 fused carpels. The inner 2 carpels are sterile and fused face to face to form the central partition of the fruit. The outer 2 carpels (or valves) are fertile and fused to the central partition (or septum).

- a. Silicle with a narrow septum, narrower than the width of the pod Group A
- aa. Silique not compressed or compressed parallel to the septum, the latter thus as wide as the fruit.
 - b. Fruit a silicle, that is a small silique, usually less than 3 times as long as wide Group B
 - bb. Fruit a silique, usually at least 4 times as long as wide
 - c. Silique with an indehiscent beak Group C
 - cc. Silique dehiscent to the base of the style.
 - d. Flowers white or pink to purple.
 - e. Leaves deeply dissected Group D
 - ee. Entire to merely toothed Group E
 - dd. Flowers yellow Group F

Group A

Fruit a silicle compressed perpendicular to the partition, the septum thus narrower than the width of the fruit.

- a. Leaves all basal, usually submerged.....1. Subularia p. 48
- aa. Stem leafy; terrestrial plants.
 - b. Silicle strongly flattened, more than twice as large as thick.
 - c. Silicle obdeltoid 22. Capsella p. 64
 - cc. Silicle orbicular to short-ovate.
 - d. Silicle very large, with 2 seeds in each locule 4. Thlaspi p. 52

- dd. Much smaller, the locules mostly one-seeded 2. Lepidium p. 49
- bb. Much less flattened.
 - e. Stigma quite sessile 21. Hutchinsia p. 64
 - ee. Style short to very long.
 - f. Petals yellow; pod very much inflated 19. Physaria p. 63
 - ff. Petals white; pod small.
 - g. Silicle indehiscent..... 3. Cardaria p. 52
 - gg. Silicle dehiscent..... 5. Cochlearia p. 53

Group B

Fruit a silicle, either not compressed, or compressed parallel to the septum, thus the latter is as large as the width of the fruit.

- a. Flowers white.
 - b. Basal leaves very large, 4-8 dm long; silicle subglobose 17. Armoracia p. 61
 - bb. Much smaller; silicle much flattened.
 - c. Basal rosette present and well developed 25. Draba p. 66
 - cc. Annuals without basal rosette.
 - d. Petals entire; valves of the fruit convex 30. Alyssum p. 76
 - dd. Petals deeply cleft; valves flat 31. Bertoreia p. 76
 - aa. Flowers yellow.
 - e. Pod indehiscent or breaking off transversally at maturity.
 - f. Pod globose and indehiscent 24. Neslia p. 65
 - ff. Pod elongate, breaking in two at the median constriction 14. Rapistrum p. 58
 - ee. Dehiscent longitudinally.
 - g. Pod strongly flattened, at least twice as wide as thick 25. Draba p. 66
 - gg. Much less flattened.
 - h. Stem leaves much divided, bipinnatifid to bipinnate 8. Descurainia p. 54
 - hh. Leaves entire to pinnatifid.
 - i. Glabrous or with simple hairs 16. Rorippa p. 59
 - ii. Stellate-pubescent.
 - j. Stem-leaves sessile, with a sagittate base ...23. Camelina p. 64
 - jj. Stem-leaves cuneate at base 20. Lesquerella p. 63

Group C

Silique with a tapered indehiscent beak.

- a. Silique coarse and indehiscent, but monoliform

- and breaking up into a series of articles
at maturity 13. Raphanus p. 58
- aa. Silique smaller and dehiscent.
- b. Leaves entire 36. Conringia p. 79
- bb. At least dentate.
- c. Beak very flat while the body
of the silique is nearly terete... 9. Eruca p. 55
- cc. Beak not more flattened than the
body of the silique.
- d. Raceme leafy at base; at least
the lowest flower subtended by
a pinnatifid leaf..... 11. Erucastrum p. 56
- dd. Raceme leafless.
- e. Seeds in two rows in each
locule; beak short, mostly
2-3 mm long 10. Diplotaxis p. 56
- ee. Seeds in one row; beak
usually much longer....12. Brassica p. 56

Group D

Silique dehiscent to the base of the style. Flowers white
or pink to purple. Leaves deeply dissected.

- a. Silique very flat 28. Arabis p. 72
- aa. Cylindric or quadrangular to barely flattened.
- b. Foliage grayish-pubescent 26. Smelowskia p. 71
- bb. Foliage green, glabrous to lightly
pubescent.
- c. Silique straight.....18. Cardamine p. 61
- cc. Silique falcate16. Rorippa p. 59

Group E

As group D with the leaves entire or merely dentate.

- a. Flowers and fruits sessile 35. Matthiola p. 78
- aa. Pedicels obvious and elongate.
- b. Flowers large, 2.0-2.5 cm long..... 34. Hesperis p. 78
- bb. Much smaller.
- c. Septum with a large window 6. Eutrema p. 53
- cc. Septum not perforated.
- d. Lowest flower of the raceme
borne opposite a leaf.....33. Malcolmia p. 78
- dd. Lowest flower borne well above
the uppermost leaf.
- e. Glabrous or with simple hairs.
- f. Stem leaves sagittate-
amplexicaul at base.
- g. Silique \pm 1.5 cm
long 27. Thellungiella p. 71
- gg. Much longer, about
1 dm long..... 36. Conringia p. 79

- ff. Stem leaves cuneate at base to petiolate ..
 18. Cardamine p. 61
- ee. Pubescence mostly or entirely of branched hairs.
- h. Silique strongly flattened 28. Arabis p. 72
- hh. Silique terete or nearly so.
- i. Petals purple, 1-2 cm long 29. Erysimum p. 75
- ii. Much smaller.
- j. Silique torulose ..
 32. Braya p. 77
- jj. Silique of even width... 37. Halimolobos p. 79

Group F

Silique dehiscent to the base of the style. Flowers yellow.

- a. Stem leaves entire to dentate.
- b. Pubescence malpighiaceous 29. Erysimum p. 75
- bb. Glabrous or nearly glabrous with some simple and forked hairs at base of stem.
- c. Leaves narrowly linear; long attenuate at base 7. Sisymbrium p. 53
- cc. Stem-leaves much broader and auriculate at base.
- d. Glabrous; silique quadrangular ..
 36. Conringia p. 79
- dd. Stem pilose toward the base; silique terete 28. Arabis p. 72
- aa. Leaves deeply lyrate to tripinnate.
- e. Leaves bipinnate to tripinnate....8. Descurainia p. 54
- ee. Lyrate to pinnatifid.
- f. Silique short, about as long as, to much shorter than, its pedicel....16. Rorippa p. 59
- ff. Silique many times longer than its pedicel.
- g. Stem-leaves sessile and more or less amplexicaul 15. Barbarea p. 58
- gg. Narrowed into a petiole....7. Sisymbrium p. 53

1. SUBULARIA L.

Silicle only slightly compressed and with many seeds in each locule. Flowers white.

1. S. aquatica L. var. americana (Mull. & Cald.) Boivin--
 Awater (Alène d'eau) -- Submerged aquatic, small and inconspicuous. Leaves all basal, narrowly linear, Resembling a small Isotetes. Flowers few. Silicle obovate. Mid to late summer.

Shallows of fresh-water lakes and streams. -- G, K-Mack-(Y)-Aka, L-NF, NS, Q-S, BC, US, Eur.

Sepals \pm persistent in fruit. In typical var. aquatica from Eurasia and Alaska the sepals are deciduous, the fruit is generally somewhat narrower and the pedicels are frequently more divergent.

2. LEPIDIUM L.

PEPPERGRASS

A main type, with a very flat and short silicle. Each locule with only one seed. Silicle compressed perpendicular to the septum, the latter very narrow. Stamens often only 4 or 2. Petals white, sometimes lacking.

- a. Upper leaves deeply cordate-clasping and seemingly perfoliate 1. L. perfoliatum
- aa. Leaves sessile or petiolate.
 - b. Silicle 5-6 mm long.
 - c. Silicles on spreading pedicels..... 2. L. campestre
 - cc. Pedicels stiffly erect to appressed 3. L. sativum
 - bb. Silicle much smaller, 2.0-3.5 mm long.
 - d. Silicle entire at tip 4. L. latifolium
 - dd. Silicle deeply retuse at summit.
 - e. Silicle nearly orbicular..... 6. L. densiflorum
 - ee. Silicle longer, short-elliptic, about $1\frac{1}{2}$ times as long as wide.
 - f. Silicle puberulent or at least short ciliate..... 8. L. ramosissimum
 - ff. Glabrous.
 - g. Main stem-leaves serrately lobed 7. L. Bourgeauanum
 - gg. Remotely pectinately partite 5. L. ruderales

1. L. PERFOLIATUM L. -- Upper leaves seemingly suborbicular and perfoliate, but actually deeply cordate and the basal lobes overlapping. Lower leaves bipinnately partite to tripinnately partite, the segments narrow. Herbage somewhat glaucous. Branching tending to dichotomy. Silicle about 4 mm long. Late spring to early summer. A rare weed of roadsides and railway sidings. -- sO, swS-swAlta-BC, US, Eur.

2. L. CAMPESTRE (L.) Br. -- Cow-Cress, Field-Cress (Cresson des champs, Passerage sauvage) -- The large silicle somewhat spoon-shaped, that is somewhat concave above and quite convex below. Soft puberulent throughout. Leaves finely toothed. Pedicels spreading horizontally, the finely vesiculose silicles ascending. Late spring to late summer. Uncommon weed of disturbed soils, mostly along roads and railways. -- NF, NS-O, swAlta-BC, US, Eur.

We know it in our area only from Frank and Macleod (both at DAO).

3. L. SATIVUM L. -- Garden-Cress (Cresson alénois, Cress-

son des jardins) -- Like the preceding with a large and somewhat spoon-shaped silicle, but borne on a nearly erect pedicel. The whole plant glabrous and slightly glaucous. Leaves pinnatipartite to tripinnatipartite. Late spring to late summer. Sometimes cultivated and readily reseeding itself in loose soils. -- (G), Mack-(Y), NS-Alta-(BC, US), Eur.

The only Manitoba location is Winnipeg from where it was reported by Bourgeau in 1863, by Macoun in 1883 and where we found it again in 1959.

4. *L. LATIFOLIUM* L. -- (Grande passeraie, Herbe au poivre) Tall stoloniferous perennial. About 1 m high and glabrous except the pilose silicles. Leaves thickish, ovate to lanceolate, serrate. Silicle not retuse at tip. Mid summer. Locally naturalized around a slough: Lethbridge. -- Q-O, Alta, US, (CA), Eur.

5. *L. RUDERALE* L. -- Peppergrass (Puette, Cresson puant) -- Petals lacking and lower leaves much divided. Basal leaves bipinnatipartite to tripinnatipartite; stem-leaves pinnatipartite to bipinnatipartite; inflorescence-leaves quite entire, narrowly linear-ligulate, slightly wider above the middle, rounded and perhaps thickish at tip. Racemes all or nearly all elongate. Silicle 2.0-2.5 mm long, glabrous, short-elliptic, with acutish shoulders and a septum 0.5 mm longer than the width of the silicle. Late spring and early summer. Infrequent weed of sidewalks and laneways in towns and cities. -- NS-S, (US), Eur.

Known from a few towns and cities in southern Manitoba, but yet only from Regina in Saskatchewan (REG; DAO, photo).

6. *L. densiflorum* Schrader var. *densiflorum* (var. *Bourgeauanum* AA., var. *macrocarpum* Mulligan; *L. apetalum* AA.) -- Peppergrass -- Silicles small and nearly round, the septum as long as the width of the fruit. Lower leaves $\frac{1}{2}$ lobed; stem-leaves toothed; inflorescence leaves remotely serrate to entire. Racemes all or mostly elongate. Petals small and inconspicuous. Silicle glabrous, about 2.5 mm long, the shoulders rounded or obtuse. Early to mid-summer. Light soils, especially if disturbed, in open or semi-open places, often weedy. -- Mack-Aka, L-NF, NS-BC, US, Eur -- Var. *elongatum* (Rydb.) Thell. -- Silicle minutely ciliate. Val-Marie, Craigmyle. -- Y-Aka, S-BC, (US).

7. *L. Bourgeauanum* Thell. -- Usually with many elongate terminal racemes and more numerous, short, axillary ones. Leaves varying from deeply lobed at base to remotely serrate or entire in the inflorescence. Main branches numerous or many, and mostly of about the same length. Petals short and inconspicuous. Silicle glabrous, 2.5-3.5 mm long, short-elliptic, the shoulders acutish, the septum obviously longer than the width of the fruit. Disturbed or sandy soils. Early to mid summer. -- Mack-Aka, NF, NB-BC, US, Eur.

Native with us, a weed further east.

Quite closely related to the eurasian *L. apetalum* to which it might perhaps be realistically attached as a variety based primarily on type of pubescence.

The trio Bourgeauanum-densiflorum-ramosissimum is made of rather similar plants and the distinctiveness of one of them, L. Bourgeauanum, was recently questioned by one of the specialists of the group. We find the three to be reasonably distinct and they may be further contrasted as follows on their general appearance in typically full grown plants.

L. densiflorum -- Racemes few (or single) or, if more numerous, tending to form a corymb. Branches borne in the upper part of the plant only, strongly ascending and simple or some of the primary branches ramified and bearing 2-3 terminal and subterminal racemes. (In the other two, the branching is more elaborate and is not confined to the upper part of the plant). Racemes all or nearly all elongated, the longest commonly twice as long as the shortest. (More unequal in the other two, the main racemes being 2-6 times longer than the many short ones). Raceme at the end of the stem developing earlier and becoming longer than all or most other racemes. Pedicels elongating slowly in such a way that each raceme will be of a uniform width below, but will be gradually narrower in the last 3-5 cm. (More quickly elongating in the other two, so that the raceme is narrowed only in the last centimeter or so).

L. Bourgeauanum -- Branches numerous and \pm isomegueth, bearing many and strongly dimegueth racemes. Branching, tending to form a leafy, elongated and compound raceme of racemes. Each primary branch bearing a terminal raceme and a few lateral and short ones, so that the short racemes are more numerous than the long ones. Branches shorter than in the next, the terminal raceme usually longer than the rest of its branch. Terminal racemes developing simultaneously and the central one not especially longer than the rameal ones.

L. ramosissimum -- More branchy and the leaves more deeply cut. Rosette leaves (and lower stem leaves) pinnatifid (pinnatifid in the other two species), the stem leaves pinnatifid (serrate to lobed in the other two), and the inflorescence leaves at least in part remotely lobed (entire to serrate in the other two). Generally branched to the base and the lower branches successively longer, the lowermost becoming about as long as the stem. Racemes very numerous and less strongly contrasted in length; each primary branch bears an elongated terminal raceme and a number of lateral ones, some of which elongate, others don't, so that in fully grown plants the elongated racemes tend to be more numerous than the short ones.

These characters give to each member of the trio a distinctive habit in the field, over and above the finer points of floral and fruit morphology. As is often the case with annuals, there is however much variation in response to drought, tramping, browsing and other factors. The type and a probable isotype of L. Bourgeauanum were examined a few years ago; both belong quite clearly with this name as interpreted here and by G.A. Mulligan in Madroño 16: 89. 1961.

8. L. ramosissimum Nelson (L. divergens Osterh.) -- Silicle finely puberulent at least along the edges, otherwise simi-

lar to that of *L. ruderale* but a bit longer, 2.5-3.0 mm long. Generally very branchy and branched from the base with the lower branches nearly as long as the stem. Main leaves deeply lobed; inflorescence-leaves at least in part remotely lobed. Racemes numerous, variable in size, mostly elongate. Petals $\frac{1}{2}$ to $\frac{3}{4}$ as long as the sepals. All summer. Open or disturbed ground, often weedy. -- Mack, Q-BC, US.

Known east of us only as an adventive.

3. CARDARIA Desv.

HOARY CRESS

Differs from Lepidium by its indehiscent silicle, not so much flattened.

- a. Silicle glabrous 1. C. Draba
 aa. Pubescent 2. C. pubescens

1. C. DRABA (L.) Desv. var. DRABA (Lepidium Draba L.) -- Hoary Cress -- Silicle broadly cordate. Nearly glabrous perennial. Leaves thickish, serrulate, the upper amplexicaul. Inflorescence a corymb of racemes. Sepals 1.5-2.0 mm long. Silicle 2.5-3.5 mm long, clearly flattened. Locules one-seeded. Early summer. Infrequent weed of roadsides and cultivated fields. -- (NS, Q)-O-BC, US, Eur -- Var. REPENS (Schrenk) O.E. Schulz (C. chalepensis (L.) Mazz.) -- Sepals 2.0-2.5 mm long. Silicle 2.5-8.0 mm long, variable in shape, rounded to truncate at base. Locules mostly two-seeded. -- O-BC, US, Eur.

The value of var. repens is not obvious: the variation is continuous, the habitat is the same and the distribution differs little. However specimens with small and reniform pods have $2n = 64$ chromosomes while those with larger pods have $2n = 80$. This implies a certain genetic individuality for each of these minor phenotypes. Presumably this should lead to the development of an individualized distribution for each variety, at least in their country of origin.

There occurs near Lethbridge (DAO) some colonies of more or less intermediate morphology, partial sterility and variable chromosome number: $2n = 66, 67, 68, 69, 70$ and 72 . Likely, these may be inter-varietal hybrids.

2. C. PUBESCENS (C.A. Meyer) Jarm. (var. elongata Rollins) -- Quite like the preceding, but pubescent throughout. Silicle short ovoid, barely compressed. Summer. Roadsides and cultivated fields. -- Man-BC, US, Eur.

4. THLASPI L.

PENNY-CRESS

Like Lepidium, but each locule with 2 seeds.

1. T. ARVENSE L. -- Frenchweed, Stinkweed (Cennes, Herbe aux écus) -- Silicle largest, 8-12 mm wide. Upper leaves clasping, the margin sinuate. Silicle ovate, very flat, with a wide peripheral wing and a deep terminal notch, becoming yellowish and very conspicuous at maturity, borne erect on widely divergent pedicels. Late spring to late fall. Common weed of dis-

turbed soils and crop fields. -- G, Mack-Aka, L-SPM, NS-BC, US, Eur.

5. COCHLEARIA L.

SCURVY GRASS

Similar to *Cardaria* and *Lepidium* but the silicle only slightly compressed and each locule containing many seeds.

1. *C. officinalis* L. (var. *groenlandica* (L.) Gelert) -- Scurvy-Grass (Cuillerée, Herbe aux cuillers) -- Fleshy and very variable, 1-40 cm high, etc. Usually with many branches from near the base. Glabrous. Leaves entire, the lower long-petioled and cordate to reniform. Silicle 3-8 mm long, subglobose to lanceolate. First half of summer. Sea-shores; more rarely weedy or some distance inland. -- G-Aka, L-SPM, Q-nMan, BC, (US), Eur.

Rather variable as to height, branching, size of flowers, shape and size of fruits, etc. These variations have been made the basis for a number of varieties and species, but the taxonomic treatment often varies from flora to flora and we are yet unconvinced that any one such classification is more satisfactory than the others.

6. EUTREMA Br.

Like *Draba* or *Cardamine*, but the septum with a large window, the latter sometimes so large that the septum is almost reduced to its marginal nerve.

7. *E. Edwardsii* Br. -- Glabrous and slightly fleshy perennial, resembling a *Draba*, but the pod narrower, and only slightly compressed. Erect and simple, 1-2 dm high. Leaves entire, the lower long-petioled, the upper sessile and ± lanceolate. Pedicels divergent and arching. Siliques 1.0-1.5 cm long, stiffly erect and parallel to the rachis, narrowly lanceolate, barely compressed, almost quadrangular because of the strong mid-veins of the valves. Early summer. Springy spots in the tundra. -- (G), F-Mack-(Y-Aka), Q, nMan, swAlta-BC, Eur.

7. SISYMBRIUM L.

HEDGE MUSTARD

Flowers yellow; fruit a silique; hairs simple or lacking. Leaves usually deeply divided.

a. Pedicels and siliques closely appressed.... 1. *S. officinale*
aa. Divergent at 45° or more.

b. Leaves all or mostly entire 4. *S. linifolium*

bb. All pinnatifid.

c. Siliques 5-10 cm long 2. *S. altissimum*

cc. Shorter, 1-4 cm long..... 3. *S. Loeselii*

1. *S. OFFICINALE* (L.) Scop. (var. *leiocarpum* DC.) -- Hedge-Mustard (Herbe au chantre, Tortelle) -- Branches few, elongate and spreading at 90°. Herbage at least slightly hirsute below. Leaves pinnatifid, the terminal lobe larger and often hastate. Pedicels very short, 1-7 mm long, and appressed. Si-

lique about 13 mm long, tapered from the middle. Style up to 1 mm long. Summer. Disturbed soils, especially in towns and cities. -- (G, Aka, NF)-SPM, NS-Man, (Alta)-BC, US, (CA), Eur, (Afr, Oc).

Easily confused with Brassica nigra, the latter has been erroneously reported from our area.

2. S. ALTISSIMUM L. -- Tumbling Mustard (Moutarde roulante)

-- Inflorescence leaves reduced to filiform segments. Very branched and diffuse, spreading-pilose below. Leaves pinnatifid to pinnate, the segments entire to lobed. Siliques about 8 cm long, stiffly divergent at a 45° angle. Summer. Common in disturbed soil and cultivated fields. -- (G), Mack-(Y)-Aka, NF, NS-BC, US, Eur.

3. S. LOESELII L. -- Siliques 1-4 cm long, widely divergent on thin pedicels. Reflexed-pubescent below. Leaves pinnatifid with the terminal lobe usually hastate. Siliques often slightly incurved. Summer. Weed of roadsides and fields, more common in the drier parts. -- Q-BC, US, Eur.

4. S. LINIFOLIUM Nutt. (Schoenocrambe linifolia (Nutt.) Greene) -- Very branched perennial, the very narrow leaves mostly entire. Quite glabrous throughout. Siliques divergent, 3-6 cm long. Early summer. Dry pasture land; Fort Saskatchewan. -- Alta-BC, US.

Introduced from further west.

Often placed in a segregate genus because of the position of the stigmas and because it is perennial. In our specimens the stigmatic lobes are clearly placed above the placentas, same as Sisymbrium, and we are not impressed that perennity alone is in itself such a strong character as to justify generic segregation.

8. DESCURATNIA Webb & Berth. TANSY-MUSTARD

Like Sisymbrium, but the leaves more divided, pinnate to tripinnate and the hairs branched to stellate or glandular.

a. Siliques oblanceolate, rather short and not more than twice as long as its pedicel.

b. Not glandular; pedicels 2-6 mm long ..

..... 2. D. Richardsonii

bb. Nearly always glandular; pedicels

6-15 mm long 3. D. pinnata

aa. Siliques linear and longer, at least twice as long as its pedicel.

c. Hairs mostly stellate and not glandular....1. D. Sophia

cc. Not stellate, the hairs mostly simple

and glandular 4. D. sophioides

1. D. SOPHIA (L.) Webb (Sisymbrium Sophia L.; Sophia multifida Gilib.) -- Tansy-Mustard, Flixweed (Sagesse des chirurgiens, Moutarde de chien) -- Very common annual weedy Crucifer, with the grayish-pubescent leaves very finely divided, bipinnate to tripinnate. Pedicels widely ascending. Siliques \pm erect.

Late spring to mid-summer. Common weed of light, bare soils.-- G, Mack-Y, NF, NS-BC, US, (Eur).

2. D. Richardsonii (Sweet) O.E. Schultz var. Richardsonii (Sisymbrium incisum var. Hartwegianum AA.; Sophia Richardsoniana sphalm.)-- Tansy-Mustard -- Much like the preceding and similarly grayish stellate-puberulent, but the pedicels 2-6 mm long, strongly ascending to appressed. Siliques 3-10 mm long, straight. Summer. Roadsides and other bare soils. -- Mack-Aka, Q-BC, US.

In var. macrosperma O.E. Schulz (including var. procera (Greene)Breitung) from the western U.S. the herbage is glabrous or nearly so. Var. procera was listed for Waterton, Alta., by Breitung 1957 but the one specimen examined, A.J. Breitung 16357 (ALTA; DAO, photo) turned out to be D. pinnata var. filipes.

We must however mention that two collections from Whitehorse and one from Maple Creek have the foliage pubescent yet are nearly glabrous in the inflorescence. They are thus intermediate to var. macrosperma.

Other intermediates also exist. Some from Whitehorse and B.C. have the pubescence as described above for the Maple Creek sheet but the siliques and pedicels are somewhat shorter, which makes them intermediate to D. pinnata and especially to its var. glabra (Woot. & Standl.) stat. n., Sophia glabra Woot. & Standl., Contr. U.S. Nat. Herb. 16: 127. 1913, in which the siliques are only 5-8 mm long.

3. D. pinnata (Walter) Britton var. brachycarpa (Rich.) Fern. (Sisymbrium canescens AA.; Sophia brachycarpa (Rich.) Rydb.; S. filipes AA.) -- Tansy-Mustard -- Leaves, stem and rachis of the inflorescence lightly to densely glandular-puberulent. Pedicels 6-15 mm long and widely divergent. Siliques nearly erect and about as long as its pedicel. Summer. Open soils; common weed throughout the prairie regions. -- Mack, sQ-Alta-(BC), US -- Var. filipes (Gray) M.E. Peck (ssp. intermedia (Rydb.) Detling; D. Richardsonii (Sweet) O.E. Schultz var. viscosa (Rydb.) O.E. Schultz) -- Leaves entirely or mainly stellate-puberulent; stem usually stellate-puberulent below, becoming glandular-pubescent into the inflorescence. Common from Edmonton area westward, local eastward -- Q-O, cS-BC, US.

4. D. sophioides (Fischer) O.E. Schultz -- Rachis of the inflorescence not elongating until the siliques are fully grown, thus the young siliques surround the flower-cluster and overtop it by most of their length. Otherwise much as D. Sophia, but greener, glandular, and the falcate siliques irregularly spreading to nearly erect. Mid summer. Dry gravels northward. -- F, Mack-Aka, nMan, BC, (Eur).

9. ERUCA Adanson

Like Brassica, with a terete silique ending in a long indehiscent beak, but said beak very flat.

1. E. SATIVA Miller var. SATIVA (E. versicaria AA.) -- Rocket (Roquette) -- Petals large and veiny, like those of Raphanus. Annual, somewhat fleshy, slightly glaucous and nearly

glabrous. Calyx about as long as the claw, the claw slightly longer than the blade of the petal, the latter about 1 cm long, white to yellowish and sharply veined in purple. Summer. Rare impurity in seed or exceptional escape. -- Q-O, S, US, SA, Eur.

Groh 1946 reports this species as first appearing in Saskatchewan in 1908, in Alberta in 1910 and in Manitoba in 1911, citing however only one substantiating collection, from Grenfell in 1908. This single sheet is still the only specimen from our area at DAO. A fair amount of correspondence has survived dated around 1910 and relating to specimens sent in for identification and reported on as *E. sativa* by J.W. Eastham for a series of Ontario sources, by H. Groh for a Bradwell (Sask.) and a Lacombe (Alta.) sending. Also by F. Fyles for a Carnduff (Sask.) correspondent. None of the specimens received were preserved (not an uncommon practice at the time) and all these reports remain unconfirmed to this day. Breitung 1959 mentions 3 more Saskatchewan localities. The Manitoba report remains completely unsubstantiated: no specimen, no correspondence.

10. DIPILOTAXIS DC.

Similar to Brassica, but the seeds in two rows in each locule.

1. *D. MURALIS* (L.) DC. (f. caulescens Kittel) -- Skunk-Weed, Sand-Rocket. -- Petals yellow, usually drying pinkish. Plant leafy only in its lower $\frac{1}{4}$ or the leaves all basal. Leaves lyrate. Stem simple or diffusely branched from the base. Pod linear, ascending on widely divergent pedicels. Beak very short and not obviously distinct from a style. Late spring to early fall. Infrequent weed of disturbed soils. -- NS-Alta, US, Eur.

D. tenuifolia (L.) DC. was reported for Alberta by Groh 1950 on the basis of collections from Calgary, Macleod and Pincher Creek (DAO). All 3 were revised by Dr. C. Frankton to *D. muralis* on that same year.

11. ERUCASTRUM Presl.

Mid-nerve of the valve strongly proeminent, the silique thus \pm 4-angled. Otherwise as in Brassica.

1. *E. GALLICUM* (W.) O.E. Schulz -- Dog-Mustard (Fausse Roquette) -- Lowest 1-(3) siliques borne in the axil of a pinnatifid leaf. Pubescent throughout, except the pedicels and siliques. Stem retrorse-strigose. Leaves large, pinnatifid, Flowers white. Siliques long linear, widely divergent. Beak short and not obviously distinct from the style. Summer and early fall. Occasional weed of disturbed soils. -- (NF), NS-BC, US, Eur.

12. BRASSICA L.

MUSTARD

One of the basic types of the family. Silique terete, the valves dehiscent, the seeds in one row in each locule.

Fruit tapered at the tip into an indehiscent beak which sometimes contains a seed.

- a. Body of the silique densely hispid 1. B. hirta
- aa. Silique glabrous to slightly retrorse-hispid.
 - b. Upper leaves rounded to cuneate at base.
 - c. Pedicels 2-7 mm long 2. B. Kaber
 - cc. 10-15 mm long at maturity 3. B. juncea
 - bb. Upper leaves deeply cordate and clasping at base 4. B. campestris

1. B. HIRTA Moench (B. alba (L.) Rabenhorst; Sinapis alba.) -- White Mustard, Charlock (Moutarde blanche, Moutarde anglaise) -- Body of the silique densely hispid and puberulent. The whole plant more or less retrorse-hispid. Pedicels mostly widely divergent. Beak of the silique obviously flattened and at least as long as the body. Summer. Rare weed: Otterburne, Cudworth, Melville, Beaverlodge. -- (G, Y), PEI-BC, US, Eur.

2. B. KABER (DC.) L.C. Wheeler (var. pinnatifida (Stokes) L.C. Wheeler, var. Schkuhriana (Rchb.) L.C. Wheeler; B. arvensis AA.; -- Mustard, Wild Mustard (Moutarde d'été) -- Somewhat retrorse-hispid in the lower half, sometimes also above, including the siliques. Pedicels stoutish and short. Silique 2-5 cm long, thin and torulose to thickish. Valves with 3 strong nerves nearly equally prominent. Beak about 1 cm long, gradually tapered, somewhat flattened, often containing one seed. Summer. Very common weed, especially in cereal crops. -- (G), sMack-Y-(Aka), L-NF-(SPM), NS-BC, US, Eur.

Specimens with bigger siliques may be called var. pinnatifida and the opposite phenotype can then be labelled var. Schkuhriana. The variation is however continuous and is often very wide on the same plant. Seems to be an arbitrary distinction.

3. B. JUNCEA (L.) Cosson -- Indian Mustard, Chinese Mustard -- Similar to the preceeding but glabrous to slightly retrorse-hispid below. Often slightly glaucous. Pedicels thinner and longer. Siliques 2-5 cm long. Valves with only one strong mid-nerve. Beak abruptly contracted at base, seedless and nearly terete. Summer. Common weed of cultivation. -- Mack, (Aka), NF, (NS-NB)-Q-(O-Man)-S-BC, US, Eur.

4. B. CAMPESTRIS L. (B. Napus L.) -- Field-Mustard -- Glaucous and the pods thickish and very long, (3)-5-7-(10) cm long, including the beak 0.6-1.5 cm long. Glabrous or slightly setulose-hispid below. Leaves thickish, the lower lyrate with a very large terminal lobe, the upper much smaller and usually entire, deeply cordate and clasping, largest near the base. Pedicels long, divergent to spreading. Beak usually containing one seed. Summer. Casual weed of crops roadsides and fields.-- (G), sMack-Aka, L-NF, NS-BC, US, CA, SA, Eur.

Two races occur. They may be identified by their pollen size, but are not otherwise readily recognizable in the herbarium except in their extreme forms. Specimens with small petals, less than 10 mm long, or long beaks, at least 14 mm long and at

least $\frac{1}{3}$ the length of the valves may be referred to B. campestris proper. Those with short beaks, less than 10 mm and less than $\frac{1}{4}$ the length of the valves may be named B. Napus. The latter is known as a weed from Brandon, Saskatoon, etc.

13. RAPHANUS L.

RADISH

Fruit divided into two parts; the lower reduced and seedless or abortive; the upper large and seed-bearing, the seeds separated by transversal partitions. Fruit constricted at the level of the partitions.

1. R. RAPHANISTRUM L. var. RAPHANISTRUM -- Wild Radish, Jointed Charlock (Rave sauvage, Ravenelle) -- Fruit large and thick, 3-7 cm long, becoming moniliform in drying, breaking up into a series of strongly ribbed articles. Root thin. Petals 1-3 cm long, variable in colour. Silique with 1-8 one-seeded articles. Beak 1.5-2.5 cm long, rather cylindrical. Summer and early fall. Rare and evanescent weed of cereal crops: Tisdale, Two Hills. -- G, L-SPM, NS-0, S-(Alta)-BC, US, Eur -- Var. SATIVUS (L.) Beck -- Radish (Rave, Radis) -- Root thin or inflated into a Radish. Fruit shorter, 2-5 cm long, fleshier, not moniliform nor ribbed in drying, not disarticulating at maturity. Beak coarse and conical, usually about as long as the body of the silique. Summer and fall. Cultivated and infrequently reseeding itself in loose soil for a year or two; rarely as a weed in crops. -- (G, Aka), NS, NB-Man, BC, (US, Eur).

14. RAPHISTRUM Crantz

Silique divided transversally into two segments and breaking up at the partition. Lower segment short-cylindrical; upper segment subglobular, apiculate, strongly ribbed, one-seeded, indehiscent.

1. R. PERENNE (L.) All. (Raphanistrum perenne sphalm.) -- Fruit clavate, the dilated half with 8 very strong ribs. Stiffly hirsute below. Leaves pinnatifid. Silique about 1 cm long, glabrous. First half of summer. Very local weed of field crops: Grenfell, Broadview. -- S, Eur.

15. BARBAREA Br.

WINTER CRESS

Like Rorippa, but the silique elongate and narrow, so that the seeds are crowded into a single row.

1. B. vulgaris Br. (B. americana Rydb.; B. orthoceras Led.; B. stricta Andr.) -- Wintercress, Yellow Rocket (Cresson de terre, Cresson d'hiver) -- In ditches and other wet places, a very conspicuous yellow-flowered. Crucifer in late spring and very early summer. Stiffly erect biennial. Leaves clasping at base, pinnatifid to pinnatipartite, the terminal lobe much the larger. Flowers pale yellow. Siliques divergent to nearly appressed. Late spring to mid summer. Shores and wet, open pla-

ces; sometimes weedy. -- (G), Mack-Aka, L-SPM, NS-BC, US, Eur.

Variable, especially the silique, but we fail to detect anything of interest in the proposed segregates. Most commonly American authors will distinguish an introduced B. vulgaris with larger flowers and a longer beak to the silique, as against a native B. orthoceras. European authors make a parallel distinction between a B. vulgaris and a B. stricta (or B. intermedia Boreau) the latter with smaller flowers and shorter beak. These have never appeared to us as patently distinct populations in the field, while in the herbarium they are part of a morphological continuum. We remain unconvinced, hence the consolidation.

16. RORIPPA Scop.

A basic type, somewhat heterogeneous, with yellow flowers. Pubescence lacking or of simple hairs. Fruit short to elongate, commonly a silicule, but sometimes a typical silique, nearly terete, the seeds in two rows in each locule. Leaves usually pinnately and deeply lobed.

The following treatment takes into account an unpublished monograph by R.L. Stuckey dated 1965.

- a. Main stem-leaves entire to merely serrate.
 - b. Petals longer than the sepals; silicle 1.0-1.5 mm long 2. R. austriaca
 - bb. Shorter than the sepals; silicle longer and ± cylindrical 5. R. curvipes
- aa. Deeply lobed.
 - c. Fruit a typical and elongate silique, much longer than its pedicel 7. R. Nasturtium-aquaticum
 - cc. Fruit a silicle or a short silique on a long pedicel.
 - d. Biennial or annual; petals 1-2 mm long.
 - e. Pedicel 1.5-3.0 mm long 4. R. tenerrima
 - ee. Longer 6. R. islandica
 - dd. Perennial; petals much longer.
 - f. Style at least 1 mm long 3. R. sinuata
 - ff. Not exceeding 1 mm 1. R. sylvestris

1. R. SYLVESTRIS (L.) Besser -- Water-Rocket (Herbe à l'oe) -- Silique very thin, less than 1 mm wide. 1.0-1.5 cm long and borne on a pedicel nearly as long. Glabrous or puberulent perennial. Leaves pinnatipartite. Style 0.5-1.0 mm long. Summer. Rare garden weed. -- (G, NF, NS-NB)-Q-(O)-Man-BC, (US, Eur).

Known to us only from Morden, Regina, Olds and Banff. All DAO.

2. R. AUSTRIACA (Crantz) Besser -- Leaves merely serrate, lanceolate. Glabrous perennial. Pedicels many times as long as the small fruit. Silicle ovoid to oblong, 1.0-1.5 mm long, the style about 1 mm long. Early summer. Rare weed of roadsides and cultivated fields: Pilot Mound, Greenstreet, Ft.

Sask. -- Man-Alta, US, Eur.

3. R. sinuata (Nutt.) Hitchc. (R. columbiae AA.) -- Rather similar to R. sylvestris, but the silique larger and the inflorescence, including the fruits, puberulent with small vesicular hairs similar to those of Chenopodium. Pedicel about as long as the fruit. Silique 6-10 mm long, 1-2 mm wide. Style 1-2 mm long. Late spring to early fall. Rare on shores, infrequent as a weed. -- (O), sS-Alta, US.

4. R. tenerrima Greene (R. obtusa AA.) -- Like R. islandica with the silicle usually smaller and on a shorter pedicel, (1.5)-2.0-2.5-(3.0) mm long. Glabrous or the silicle minutely vesicular like last. Petals very small, about 1 mm long. Fruit longer than its pedicel. Summer. Wet ground. -- (Mack), swAlta-BC, US.

We have checked specimens from Del Bonita (DAO), Sage Creek (CAN), Calgary (TRT) and Kamloops (DAO). Otherwise nearly all specimens found under R. obtusa at DAO and MTJB have been revised to R. islandica. We do not know to what extent other herbaria need to be similarly reviewed.

An Alaska report by Hultén 1950 was based on a specimen revised to R. curvisiliqua by Stuckey.

5. R. curvipes Greene -- Pedicels often strongly recurved. Leaves entire to merely serrate, oblong to oblanceolate. Inflorescence often secund. Pedicels ascending to recurved, mostly 2-5 mm long, mostly about as long as the silicle, the latter glabrous. Petals as short or shorter than the last. (Late spring and summer?). Wet ground. -- (S-BC, US).

Reported by Stuckey from Caron, Craigmyle, Crow's Nest, Rosedale and Milk River.

6. R. islandica (Oeder) Borbas (var. Fernaldiana Butters & Abbe, var. hispida (Desv.) Butters & Abbe; R. hispida (Desv.) Britton; R. curvisiliqua AA.; R. palustris (L.) Besser; Radicula palustris (L.) Moench, var. hispida (Desv.) Rob.) -- Watercress, Marsh-Cress (Cresson de marais) -- Petals small, 1.5-2.0 mm long. Highly variable annual or biennial plant. Glabrous to hispid. Leaves pinnatifid with a much larger terminal segment. Fruit exceedingly variable, commonly a fat, oblong silicle, about as long as its pedicel. Summer. Wet places, sometimes weedy. -- G, (seK)-Mack-Aka, L-(NF), NS-BC, US, (CA, Eur).

The collection Maccun, Indian Head, 1895 (DAO) was reported as R. curvisiliqua (Hooker) Bessey by Russell 1954 and as R. sinuata by Breitung 1957. We have revised it to R. islandica.

We are not yet convinced that any of the proposed segregates represents a taxonomically significant entity.

7. R. NASTURTIUM-AQUATICUM (L.) Hayek var. NASTURTIUM-AQUATICUM -- (Nasturtium officinale Br.; Radicula Nasturtium-aquaticum (L.) Britten & Rendle) -- Watercress (Cresson, Cresson de fontaine) -- Siliques more elongate, (1.2)-1.5-(1.8) cm long and \pm falcate. Leaves seemingly pinnate. Segments mostly 5-9, oblong to suborbicular, the terminal one slightly larger. Stems reclining, soft and weak. Flowers whitish. First half of summer. Creeks and springy places. Rarely cultivated, locally

naturalized at Banff and Pincher Creek. -- NS, sQ-O, swAlta-BC, US, CA, (SA), Eur -- Var. LONGISILIQUA (Th. Irmisch) Boivin (Nasturtium microphyllum (Boenn.) Rchb.) -- Siliques more elongate, 1.5-2.5 cm long. Well established at Aweme. -- NF, PEI-sMan, BC, US, Eur, (Afr) -- X. Var. STERILIS (Airy-Shaw) Boivin -- Sterile. Pollen essentially sterile; ovaries not ripening into fruits. An introduced hybrid of our two varieties, known locally at Banff. -- NS, Alta, (US), Eur.

An earlier report of Nasturtium officinale from Manitoba was based on a Rorippa and was discounted by Scoggan in 1957.

Aweme (or Shilo) where we found var. longisiliqua in 1951 and 1959 is an old settlement on the sandy Agassiz deltaic deposits near the junction of the Souris and the Assiniboine. It is now a nearly deserted locality, and not readily identified on modern maps. But it remains well known in biological annals because of the multifarious scientific activities of the many members of the famous Criddle family.

17. ARMORACIA Gaertner, Meyer & Scherbius

Very close to Rorippa; the fruit a silicle, but the flowers white.

1. A. RUSTICANA G., M. & S. (A. lapathifolia Gilibert; Radicula Armoracia (L.) Rob.; Roripa Armoracia (L.) Hitchc.) -- Horseradish (Raifort, Moutarde des Capucins) -- With very large basal leaves on long petioles; the limb (1)-2-3-(5) dm long, ± lanceolate and dentate. Stem about 1 m high. Lower leaves ± pinnatifid; upper leaves ± lanceolate and merely dentate. Inflorescence large and showy. Silicle small, obovoid. Early summer. Cultivated and persisting, sometimes spreading to ditches and roadsides. -- (NS)-PEI-(NB)-Q-BC, US, Eur.

An extension of range to Alaska by Hultén 1945 was probably based on cultivated material since it was based on a collection by Anderson and is not mentioned in the latter's flora.

18. CARDAMINE L.

BITTER CRESS

Somewhat similar to Arabis, but the valves elastic and thus becoming spirally coiled upon dehiscence. Glabrous or with simple hairs. Leaves mostly deeply divided to pinnate. Flowers white to purple. Silique thin and long.

- a. Stem leaves entire to coarsely toothed.
 - b. Entire 1. C. bellidifolia
 - bb. Coarsely toothed 2. C. bulbosa
- aa. Stem leaves deeply divided to pinnate.
 - c. Flowers large, the petals 8-13 mm long 3. C. pratensis
 - cc. Flowers clearly smaller.
 - d. Stem pubescent below 5. C. scutata
 - dd. Stem glabrous below.
 - e. Stem leaves with oblanceolate to linear leaflets 6. C. parviflora

ee. Leaflets larger, the terminal one
elliptic to reniform 4. C. oligosperma

1. C. bellidifolia L. -- Small tufted alpine perennial with entire, ovate leaves. Only 2-10 cm high. Racemes few-flowered, often maturing only 1-3 siliques. Early summer. Rocky alpine slopes and shale slides. -- G-Aka, L, nQ, swAlta-BC, US, Eur.

2. C. bulbosa (Schreber) BSP. -- Spring-Cress -- Perennial from a fleshy bulb. Leaves reniform to lanceolate, mostly coarsely toothed. Stem solitary, usually simple with a terminal raceme of fairly showy flowers. Mid spring. Wet ground, uncommon. -- swQ-seMan, US.

3. C. pratensis L. var. angustifolia Hooker (var. palustris Wimm. & Graebn.) -- Mayflower, Lady's Smock (Fleur du tonnerre, Chasseraige) -- Leaflets of the stem-leaves narrow and all alike, not or little decumbent, entire, usually petiolate. Basal leaves often with round leaflets, all alike. Stem nearly always simple with a showy raceme of white to pink flowers. First half of summer. Wet and boggy places. -- G-Aka, L-SPM, Q-BC, US, Eur.

Grades into the more northern var. pratensis in which the leaflets are somewhat coarsely toothed, or at least the basal leaves have a three-toothed terminal leaflet.

4. C. oligosperma Nutt. var. kamtschatica (O.E. Schulz) Detling (C. umbellata Greene) -- Inflorescence short, the rachis mostly 1-2 cm long only. Stem simple or slightly branched. Basal leaves many, mostly with suborbicular leaflets, the terminal one much larger and trilobed to crenate. Stem leaves fewer, with narrower and longer leaflets. Early to mid summer. Mountain creeks. -- Y-Aka, swAlta-BC, (US, Eur).

In the more western var. oligosperma the inflorescence elongates and the rachis is usually over 3 cm long. In our more widespread variety the raceme is more condensed, often subumbellate.

5. C. scutata Thunb. (C. pensylvanica Muhl.) -- Bitter Cress -- More or less hispid below the middle, or exceptionally glabrous when submerged earlier. Commonly, the stem rather branchy. Leaflets variable, the larger lateral ones 3-10 mm wide, decurrent on the proximal side, usually toothed, the terminal one larger. Fruiting racemes \pm secund on the lateral branches. Flowers small, the petals 2-4 mm long. Style at least 0.5 mm long. Late spring and early summer. Wet soils, usually near streams. -- (sMack-Aka), NF-SPM, NS-(PEI-NB)-Q-BC, US, Eur.

Our C. pensylvanica is not obviously different from the asiatic C. scutata, as pointed out to us by a visiting Japanese botanist.

6. C. parviflora L. (var. arenicola (Britton) O.E. Schulz) -- Similar to the preceding, but glabrous throughout. Annual or biennial. Leaflets smaller, 1-3 mm wide, rather all similar, not decurrent and usually entire. Racemes not secund, the branches being incurved. Style short, often less than 0.5 mm. Early

summer. Dry, rocky outcrops, sometimes weedy. -- Mack, (NS, NB) -Q-seMan, Alta-(BC), US, Eur.

American plants, var. arenicola, are supposed to differ somewhat from the eurasian phase, but our specimens do not conform to the differences as expressed in the floras consulted.

19. PHYSARIA Gray

Like Lesquerella, but the silicle greatly inflated into a pair of bladders fused to the much narrower septum.

1. P. didymocarpa (Hooker) Gray var. didymocarpa -- Twin-Pod -- Small alpine perennial with a big and deep tap-root. Stellate-pubescent throughout. The inflated pod perhaps 1 cm across. Style becoming 5-10 mm long in fruit. Early summer. Alpine prairies and screes. -- swAlta- (seBC, US).

Various other varieties are recognized further south, including a larger fruited var. lyrata C.L. Hitchc.

20. LESQUERELLA Watson

A basic type with silicles and yellow flowers. Stellate-pubescent. Pod neither flattened nor greatly inflated, dehiscent at maturity. Stem-leaves entire or nearly so, cuneate at base.

- a. Pedicels recurved in fruit 2. L. ludoviciana
- aa. Pedicels ascending.
 - b. Pod globose or depressed-globose 1. L. arctica
 - bb. Pod elongate, ovoid to narrowly ellipsoid 3. L. alpina

1. L. arctica (Wormsk.) Watson var. arctica -- Much like the following, however the pedicels not recurved but ascending and usually straight, or slightly sigmoid. Flowers yellow. Pod glabrous. First half of summer. Loose gravels and sandy beaches: Churchill. -- G-Mack, Aka, (L)-NF, Q, nMan, nBC, (Eur)-- -- Var. Purshii Watson (L. Purshii (Watson) Fern.) -- Pods minutely white-dotted with stellate hairs. -- F, Mack-Aka, NF, seQ, swAlta-nBC.

The Alberta mention of L. arctica by Macoun 1898 was based on a Spreadborough collection from Lake Brulé (CAN; DAO, photo) in Alberta. In 1937 this specimen was correctly revised by Dr. A.E. Porsild to var. Purshii.

Our two varieties have largely coincident distributions in the overall picture, but not so within our area. The type with the stellate pods is the usual one in the Rockies and around the Gulf of Saint Lawrence; elsewhere the glabrous pod is dominant.

Other classifications have been proposed, including one in which our plant is subdivided into 2 species disjunct by some 400 miles. But to achieve this, many of our specimens would have to be identified by placing the emphasis now on one character, now on another, according to their place of origin and in relation to a preconceived distributional pattern.

2. L. ludoviciana (Nutt.) Watson var. arenosa (Rich.) Watson (L. arenosa (Rich.) Rydb.; L. argentea AA.) -- An inconspicuous species of dry hills with racemes of recurved pedicels becoming readily entangled. Perennial with numerous widely spreading stems 0.5-2.0 dm long. Densely stellate-pubescent. The yellow petals often red-tinged. Pod globular. Very early spring to early summer. Dry or eroded hills and sandy soils in the prairie region. -- Man-Alta, cNUS.

Grades further south into a var. ludoviciana with more erect and longer stems, petals yellow and the racemes little, if at all, secund.

3. L. alpina (Nutt.) Watson var. alpina (var. spathulata (Rydb.) Payson; L. spathulata Rydb.) -- Pod elongate. Similar to the preceding, but more erect, flowers yellow and the pods erect on ascending or more commonly sigmoid pedicels. Style about half as long as the pod. Late spring and early summer. Badlands. -- swS-sAlta, US.

In our variety the stem normally elongates in flower and fruit until it is many times taller than the rosette leaves. A more southern type, var. condensata (Nelson) C.L. Hitchc. is shorter, the rosette leaves often overtopping the inflorescence or nearly so.

21. HUTCHINSIA Br.

Silicle compressed laterally, but only slightly so and the stigma sessile. Flowers white. A rather small and unspecialized type.

1. H. procumbens (L.) Desv. -- Small and insignificant plant, annual and less than 2 dm high. Leaves few, small, entire, or the lower sometimes pinnatifid. Petals and sepals about 1 mm long. Pod 1.5-3.5 mm long, obovate to oblong. Late spring to early summer. Shores. -- L-NF, nMan-S-(Alta)-BC, US, Eur.

Unaccountably very rare and very sporadic. Or perhaps maybe too small and easily overlooked. For our area we have examined specimens from Churchill, Parkberg and Little Inglebright.

22. CAPSELLA Med.

SHEPHERD'S PURSE

Silicle strongly flattened laterally and obdeltoid.

1. CAPSELLA BURSA-PASTORIS (L.) Med. -- Pick-Pocket, Shepherd's Purse (Tabouret, Corne de lion) -- The very flat silicle obdeltoid to obtriangular or somewhat obcordate. Basal leaves pinnatifid. Stem-leaves mostly entire. All summer. Common weed of disturbed ground. -- G-F, Mack-Aka, L-SPM, NS-BC, US, (SA), Eur, (Oc).

23. CAMELINA Crantz

FALSE FLAX

Similar to Lesquerella, but the silicle flattened at the edge into a narrow peripheral wing.

- a. Style 1.5-2.0 mm; the body of the silicle not more than 3 times as long as the style ..
 3. C. microcarpa
- aa. Style shorter, 0.5-1.5 mm long, but the body of the silicle longer.
- b. Seed nearly twice as long as wide 1. C. sativa
- bb. Seed about as wide as long 2. C. Parodii

1. C. SATIVA (L.) Crantz -- Dutch Flax, False Flax (Sésame d'Allemagne, Sésame bâtard) -- Similar to the more common C. microcarpa, but the fruit larger and the pubescence essentially of stellate hairs. Body of the pod 6-10 mm long, obovoid, ± stipitate. Style 0.5-1.5 long on the mature pod. Seed about 1 mm wide, nearly twice as long. Summer and early fall. Casual weed of disturbed soils. -- Mack,(Aka), NS, Q-BC, (US), Eur.

2. C. PARODII Ibarra & La Porte (C. dentata AA.) -- Nearly identical to the preceding and perhaps only varietally distinct. Seed larger, 2 X 2 mm. Body of the pod 5-6 mm long, nearly as wide as long, truncate at tip, the stipe indistinct. Late spring and early summer. Rare weed. --sMan-sAlta, (US, SA).

This has appeared from time to time in cribbings from the Prairie Provinces and our knowledge of its distribution is mainly from this source. We know of actual specimens from only Arborg, Winnipeg and Aden. The Saskatchewan report rests solely on an envelope of cribbings from Delisle (DAO). Earlier reports from Swift Current were apparently based on a cultivated specimen (DAO).

3. C. MICROCARPA Andrz. -- Annual weed with obovoid and short-stipitate pods in lax racemes. Leaves entire, sagittate at base. Pubescence mixed, of small, stellate hairs and much longer hirsute hairs. Body of the silicle 3-6 mm long, obovoid, substipitate. Style 1.5-2.0 long on the mature pod. Seeds about 1 mm long, slightly narrower. Late spring to mid fall. Frequent weed of disturbed soils. -- NF, NS- BC, US, Eur.

24. NESLIA Desv.

BALL MUSTARD

Silicle indehiscent, nearly globular and slightly flattened parallel to the septum.

1. N. PANICULATA (L.) Desv. var. PANICULATA -- Ball-Mustard -- A yellow-flowered weed with long racemes of small, nearly globular and indehiscent fruits. Annual, stellate-pubescent, often simple or nearly so. Pod about 2 mm wide, reticulate-rugose. Early summer to early fall. Frequent weed of disturbed soils. -- Mack-Y-(Aka), NF, NS-BC, (US), Eur, Afr.

The valve of the pod, in the typical phase, lacks a mid-nerve. In southern Europe and the Near East it grades into a var. apiculata (F., M. & L.) stat. n., N. apiculata F., M. & L., Ind. Sem. Hort. Petr. 8: 68. 1842 with valves showing a well

defined midnerve, barely sinuous, continuous from base to summit, and more strongly rugose than the lateral nerves.

25. DRABA L.

Similar to *Arabis*, but the fruit shorter. A basic type with a typical silicle strongly compressed parallel to the septum. Flowers white or yellow. Hairs of 4 main types. Simple, forked, branched and stellate. Branched hairs have the branches spreading in all directions. Stellate hairs are lower, nearly sessile, with the branches parallel to the leaf surface and radiating from a central point.

- a. Stem leafless, or sometimes with a single small leaf Group A
 aa. Stem leafy Group B

Group A

Stem scapose.

- a. Annual; inflorescence very short and the pods 1.0-1.5 cm long 17. D. reptans
 aa. Perennial; inflorescence elongate and/or the silicles shorter.
 b. Flowers yellow, sometimes fading white.
 c. Leaves glabrous or somewhat ciliate towards the tip 4. D. crassifolia
 cc. Leaves more or less pubescent, at least on the back.
 d. Stem glabrous 6. D. oligosperma
 dd. Stem pubescent.
 e. Low plant with narrow leaves, averaging 1 mm wide 1. D. stenopetala
 ee. Taller and the leaves wider, all or mostly 1.5-4.0 mm wide.
 f. Leaves pilose to branched-pubescent 2. D. alpina
 ff. Leaves stellate-pubescent dorsally 7. D. incerta
 bb. Flowers white.
 g. Leaves not ciliate, but densely and finely stellate throughout 5. D. nivalis
 gg. Long ciliate.
 h. Densely stellate-pubescent throughout, including the silicles 12. D. cinerea
 hh. Less pubescent, at least the siliques and stem glabrous or at the most pubescent near the base only.
 i. Leaves glabrous, at least on back 4. D. crassifolia
 ii. Leaves more or less pubescent dorsally 3. D. fladnizensis

Group B

Stems leafy.

- a. Stem leaves all or mostly opposite 17. D. reptans
 aa. Alternate.
- b. Flowers yellow.
- c. Stem-leaves 1-5.
 d. Pedicel $\frac{1}{2}$ as long to slightly longer than the silicle 15. D. stenoloba
 dd. Pedicel longer, $1\frac{1}{2}$ to 4 times as long as the silicle 16. D. nemorosa
- cc. Stem-leaves more numerous, commonly 10-15 8. D. aurea
- bb. Flowers white.
- e. Stem-leaves numerous, 6-25 per stem; biennial 9. D. incana
- ee. The stem less leafy; mostly perennial species.
- f. Silicle glabrous.
- g. Perennial; pedicels narrowly divergent 10. D. hirta
 gg. Biennial; pedicels widely divergent 15. D. stenoloba
- ff. Silicle pubescent.
- h. Leaves somewhat long-ciliate towards the base; usually with only 1 stem leaf 12. D. cinerea
 hh. Not long-ciliate, merely stellate along the edge; stem leaves commonly 3-5.
 i. Plant stellate-pubescent throughout, including the silicles.....13. D. lanceolata
 ii. Fruit pubescence of simple hairs only, or in part bifurcate; stem long pilose towards the base.
 j. Perennial with broadly lanceolate pods about 3mm wide9. D. McCallae
 jj. Biennial with linear pods about 2 mm wide 14. D. praealta

1. D. stenopetala Trautv. var. stenopetala (D. densifolia AA.; D. Paysonii var. Treleasii (O.E.S.) C.L.H.) -- Small alpine perennial, densely pulvinate, the branches of the caudex densely covered with a sheath of marcescent leaves. Scape up to 5 cm high. Branched-pubescent. Leaves broadly linear, up to 5 mm long and 1 mm wide, abundantly long-ciliate, somewhat pubescent with tangled hairs. Pod ovate. Early summer. Alpine shale slides. -- (Aka), swAlta-BC, US, Eur.

It would appear that earlier Canadian reports of D. densifolia were based on specimens of other species, mostly D. stenopetala. However the B.C. report by Taylor 1966 seems justified as it is presumably based on a correctly identified sheet from Sage Creek (DAO, and probably also at UBC).

Our typical variety has pods 2-5 mm long and styles 0.5-0.8 mm long. In the southern Rockies it grades into a var. Paysonii (Macbr.) stat. n., D. Paysonii Macbr., Contr. Gr. Herb. 56: 52, 1918 with bigger pods, 5-8 mm long, and longer style, ± 1 mm.

Hultén 1945 points out the similarity of the siberian D. stenopetala with the american D. densifolia Nutt. Actually, by its smaller and more pubescent leaves and its small pod, D. stenopetala is closer to one of the segregates of D. densifolia, namely D. Paysonii, hence the nomenclature followed here. D. stenopetala is the earlier name by nearly 40 years for our Rocky Mountain plant.

2. D. alpina L. (var. Hydeana Boivin) -- Large scapose species with rather large pods and leaves, the flowers yellow. Leaves usually 3-5 mm wide, mostly oblanceolate, long-ciliate and pubescent, at least dorsally, with simple or forked or, usually, branched hairs. Mostly 1.0-1.5 dm high. Petals yellow, 4-5 mm long. Silicle very variable, commonly ovate to oblong and 4-5 mm wide, often purplish. Early summer. Open and rocky places in arctic tundra. -- (G)-F-Mack-(Y)-Aka, L, nQ-(O)-nMan, Eur.

Reports from Alberta and B.C. proved to be all based on other species and specimens found under that name in various herbaria have all been revised to other entities such as D. incerta, etc.

3. D. fladnizensis Wulfén var. heterotricha (Lindblom) Ball (D. lactea Adams) -- Resembling D. alpina, but smaller, the flowers white and the stem glabrous above the base. Leaves branched-pubescent dorsally, long ciliate, the cilia often forked or branched. Petals sometimes fading yellowish. Style short. Early summer. Wet sands and gravels in the arctic. -- (G)-F-K-(Mack-Y)-Aka, L, Q, nMan, (swAlta-BC), Eur.

All Manitoba collections were atypical, the leaves being glabrous dorsally, but abundantly ciliate with stellate hairs.

In the typical phase found in Eurasia and the northwest of us, the leaf pubescence is of simple hairs only, while they are dimorphic in our variety being stellate dorsally and simple or bifurcate marginally.

4. D. crassifolia Graham var. crassifolia (D. albertina Greene; D. Parryi Rydb.) -- Glabrous or nearly so and the leaves slightly fleshy. Otherwise quite similar to the preceding. Up to 1 dm high. Stigma sessile or very nearly so. Early summer. Alpine ridges and gravels. -- (G)-F-K-(Mack)-Y-(Aka, L), Q, swAlta-BC, US, Eur.

In the more southern and nevadan var. nevadensis C.L. Hitchc. the stem and inflorescence are pubescent.

5. D. nivalis Lilj. var. nivalis -- A small perennial species with the leaves densely and finely stellate-pubescent, not

ciliate. Flowers white. Scape mostly about 5 cm high. Silicle \pm lanceolate, flat to slightly twisted, less than 1 cm long. Early summer. Rocky outcrops north of or above timberline. -- G-Mack-(Y)-Aka, (L-NF), Q-nMan, swAlta-BC, (US), Eur -- Var. elongata Watson (D. lonchocarpa Rydb.) -- Fruit longest and most twisted. Silicle 1.0-1.5 cm long, linear, twisted by $\frac{1}{2}$ to $1\frac{1}{2}$ turns. -- (Y-Aka), swAlta-BC, (US).

6. D. oligosperma Hooker var. oligosperma -- Resembling D. stenopetala by its marcescent leaves forming a dense sheath around the branches of the caudex, but the scape glabrous and the leaves appressed-stellate-pubescent. Scapes 1-6 cm high. Leaves linguiform, 1 mm wide or less, the pubescence not very abundant and all of stellate hairs. Silicle \pm ovate. Spring. Dry rocky slopes, usually below timberline. -- (Mack-Aka), swAlta-BC, US.

The last monograph recognizes a diminutive phase known from California as var. subsessilis (Watson) Schulz.

7. D. incerta Payson -- Much as D. alpina, but the leaves stellate-pubescent dorsally. More loosely tufted. Scape pubescent. Leaves often narrower, commonly 1.5-2.5 mm wide and oblanceolate. Silicle green, \pm 3 mm wide and most often broadly lanceolate. Spring and early summer. Shale slopes above timberline. -- (Mack), swAlta-BC, wUS.

8. D. aurea Vahl. var. aurea (D. manganensis (Vict.) Fern.) -- The stem very leafy like D. incana, but the flowers yellow and usually a short-lived perennial. Stellate-pubescent throughout, the stem also somewhat pilose. Pod lanceolate, slightly twisted, puberulent, the hairs often simple, short and reflexed. First half of summer. Subarctic or subalpine, on gravelly or sandy shores and cliffs, especially if disturbed. -- (G), K, (Y-Aka), L, Q-BC, US -- Var. leiocarpa (Payson & St. John) C.L. Hitchc. -- Silicle glabrous. -- (Alta)-BC, (US).

9. D. McCallae Rydb. -- Closer to the last by its pubescence, but more similar to D. hirta by its habit. Herbage stellate-puberulent throughout but the stem long pilose below. Stellate hairs with simple branches. Stem leaves (3)-5-(12). Flowers white, fading yellowish. Silicle (7)-8-10-(12) mm long, (2)-3-(4) mm wide, narrowly oblong to lanceolate, densely puberulent with simple and somewhat ascending hairs. Early summer. Alpine gravels and talus slopes. -- swAlta-neBC.

10. D. incana L. (var. confusa (Earh.) Lilj.) -- Very leafy biennial. 1-4 dm high. Stem and leaves densely pubescent, the pubescence mixed, part stellate, part pilose. First year rosette very dense, hemispherical, marcescent. Leaves numerous, dentate. Flowers white. Pod lanceolate, slightly twisted. Mid summer. Usually on gravel, especially if disturbed. -- G, K, L-SPM, PEI, Q-nMan, (US), Eur.

Macoun and other older authors were wont to use this name in the sense of D. hirta, but his report of 1883 from the Bow River Pass turned out to be based on a specimen of D. aurea (CAN; DAO, photo). The numerous Manitoba reports proved to be all based on misidentifications except those from Churchill.

The Bell collection from York Factory in 1880 (QK; DAO, photo) was a D. hirta, while his Churchill River collection of 1879 (QK; DAO, photo) is more accurately referred to D. lanceolata. Similarly, Macoun's reports from B.C. were also based on specimens of other white-flowered species, including D. lanceolata.

11. D. hirta L. var. hirta (D. arabisans Mx.; D. dahurica sphalm.; D. daurica DC.; D. glabella Pursh) -- A middling species with white flowers and leafy stem. Perennial. Leaves dentate, the stem ones usually 3-5. Stellate-pubescent throughout, except the glabrous pods. Hairs doubly stellate, some of the primary branches being minutely branched toward the tip. Stems 1-4 dm high. Silicle about 1 cm long, lanceolate, flat to slightly twisted. Early summer. Dry cliffs and gravels. -- G-Mack-(Y)-Aka, L-NF-(SPM), NS, NB-Man, (BC), US, Eur.

We can detect no substantial difference between D. arabisans, D. daurica and D. glabella. And D. arabisans is the earliest name. But we have used the still earlier D. hirta, a name discarded by most authors because of past misuse, abuse and confusion.

Two other varieties occur around the Gulf of Saint Lawrence, a var. laurentiana (Fern.) Boivin with the stem pubescence mixed with longer and simple hairs towards the base, and a var. pyncnosperma (Fern. & Knowlt.) Boivin with shorter and fleshy pods.

12. D. cinerea Adams -- Intermediate between the scapose and leafy species, the stem usually bearing only 1 leaf. Fruiting stems about 1 dm high. Densely stellate-puberulent throughout, and pubescent on the leaf faces and pods with doubly stellate hairs, like the last, the leaves also long-ciliate below the middle. Leaves 1-4 mm wide, ovate to oblanceolate. Flowers white, often drying yellow. Early summer. Silicles oblong to lanceolate. Sandy or gravelly shores and banks. -- G-(F)-K-Mack-(Y)-Aka), Q-nO, nWS-swAlta-(nBC), Eur.

The only reported Manitoba collection, E. Beckett 184a, Churchill, Aug. 1, 1953 (CAN; DAO, photo) has been revised to D. lanceolata.

13. D. lanceolata Royle -- Silicles pubescent with partly stellate hairs. Otherwise pretty much like a smaller D. hirta and perhaps of debatable value. Early summer. Dry gravels and cliffs. -- G, seK, Y-(Aka), L, NB-Q-(O)-nMan-nS-swAlta-BC, US, Eur.

14. D. praealta Greene -- Siliques elongate and \pm linear like the next, but pubescent and the flowers white. Biennial, pubescent throughout and often much branched below. Pedicels about half as long as the siliques, the latter erect and mostly 1.0-1.5 cm long. Mid spring to early summer. Open rocky places -- Mack-(Y), swAlta-BC, US.

15. D. stenoloba Led. var. stenoloba -- Flowers yellow, often lightly pink-tinged near the tip. Biennial plant, glabrous above the middle, lightly stellate-pubescent below, including the leaves. Stem leaves few. Siliques erect, lanceolate to linear, about as long as the widely divergent pedicels.

Early to mid summer. Subalpine to alpine slopes. -- (Y)-Aka, swAlta-BC, (US) -- Var. nana (O.E. Schulz) C.L. Hitchc. -- Stem more coarsely pubescent, mainly pilose, the hairs spreading and mostly simple to bifurcate. Leaf pubescence tending to be similar. -- Y, swAlta-sBC, US.

Var. nana may be an essentially sympatric segregate, hence of questionable value.

16. D. nemorosa L. var. nemorosa (D. nemoralis sphalm.)-- Annual with lanceolate silicles on very long pedicels. Pilose to stellate-puberulent throughout, including the puberulent pods. Leaves variable, often rather large for the genus. Pedicels 0.7-3.0 cm in fruit. Early spring to early summer. Light soils, especially if disturbed. -- O, sS-BC, US, Eur -- Var. leiocarpa Lindblom (D. lutea Gilib.) -- Fruit glabrous. -- F, Mack-Y-(Aka), swQ-Alta-(BC), US, Eur.

17. D. reptans (Lam.) Fern. var. micrantha (Nutt.) Fern. var. stellifera (O.E. Schulz) C.L. Hitchc.; D. caroliniana Walter var. micrantha (Nutt.) Gray -- Silique elongate, like the last three, and annual, but the pedicels very short. Less than 1 dm high, tufted and easily overlooked. Leaves coarsely pubescent, all basal, or some of them borne near the base and mostly opposite. Stem naked for most of its length. Inflorescence short, its rachis shorter than the pods. Siliques strigose, 1.0-1.5 cm long, mostly 3-5 times longer than their pedicel. Early to mid spring. Sandy or gravelly prairie, especially if disturbed. -- sMan-sS-sAlta, US.

The more eastern typical phase has glabrous pods.

26. SMELOWSKIA C.A. Meyer

Resembles Draba or Eutrema, but the silicle barely compressed and strongly keeled along the midnerve of the valves.

1. S. calycina (Stephan) C.A. Meyer var. americana (Regel & Herder) Drury & Rollins -- Similar to Draba, but the leaves pinnatifid. Densely tufted perennial. Pubescent throughout, but the density variable; usually the basal leaves are whitish-stellate and the inflorescence is long villous. Stem leaves more deeply divided than the basal ones. Silicle \pm 1 cm long, narrowly oblanceolate, lightly long villous to glabrous. Early summer. Alpine rock slides and rocky ridges. -- swAlta-sBC, (US).

The more northern var. integrifolia (Seeman) Rollins has the leaves entire or merely slightly toothed.

27. THELLUNGIELLA O.E. Schulz

Similar to Arabis, but the silique terete and the whole plant glabrous. Flowers white.

1. T. salsuginea (Pallas) O.E. Schulz (Arabidopsis glauca (Nutt) Rydb.; Halimolobos virgata AA.) -- Glabrous and glaucous biennial resembling an Arabis. Rather branchy. Stem leafy, the leaves oblong, entire, deeply amplexicaul. Siliques nearly

erect on widely divergent pedicels. Mid spring to mid fall.
Sandy alkaline soils. -- Mack-Y, (wO)-Man-BC, (US, Eur).

28. ARABIS L.

ROCK CRESS

A basic type with a typically narrow silique flattened parallel to the septum. Flowers white to mauve. Silique dehiscent to the tip, without a beak. Stigma sessile or nearly so. Pubescence present, of branched or stellate hairs, often with some simple ones mixed in. One species is quite atypical.

- a. Siliques recurved-falcate and slightly ascending to descending or pendulous and straight.
 - b. Pedicels sharply reflexed at base; siliques pendent, straight 9. A. retrofracta
 - bb. Pedicels and siliques spreading to descending.
 - c. Silique 2-5 cm long 8. A. Lemmonii
 - cc. Longer, 5-10 cm, but narrower.... 7. A. divaricarpa
- aa. Siliques ascending to erect, mostly straight.
 - d. Pedicels and siliques closely appressed to the rachis and parallel to one another.
 - e. Silique \pm 1 mm wide, cylindric to \pm flattened.
 - f. Flowers yellow, silique 5-9 cm long 2. A. glabra
 - ff. Flowers white, silique 3-5 cm long 4. A. hirsuta
 - ee. Siliques 1.5-3.0 mm wide, strongly flattened.
 - g. Rosette leaves with malpighiaceous pubescence 5. A. Drummondii
 - gg. Rosette leaves glabrous to densely stellate pubescent 6. A. Lyallii
- dd. Pedicels and siliques \pm divergent.
 - h. Siliques 5-7 cm long 7. A. divaricarpa
 - hh. Siliques 1-5 cm long.
 - i. Siliques 1.5-3.0 mm wide.
 - j. Siliques 3-5 cm long 6. A. Lyallii
 - jj. Siliques shorter, 1-3 cm long 10. A. arenicola
 - ii. Siliques narrower, 0.5-1.5 mm wide.
 - k. Basal leaves lyrate to pinna-tifid 1. A. lyrata
 - kk. Entire 3. A. Nuttallii

1. A. lyrata L. -- Rosette leaves sometimes dentate, but mostly lyrate-pinnatifid. Stems 1-3 dm high, often numerous. Stem leaves oblanceolate to oblinear, long cuneate at base. Siliques divergent, about 2-3 cm long. Mid spring to mid summer. Sandy places, especially in open Jack Pine forests. -- Mack-Aka, (Q)-O-BC, US, (Eur).

The distinction of a less pubescent var. kamchatica Fisher does not appear to be taxionomically significant.

2. A. glabra (L.) Bernh. (Turritis glabra L.) -- Tower-Mustard (Moutarde blanche, Tourette) -- Siliques terete, flowers yellow. Tall and stiffly erect biennial, somewhat glaucous, glabrous except near the base and on the rosette. Siliques (5)-6-7-(9) cm long, appressed. Summer. Sandy or rocky soils, in open or semi-open places, often weedy. -- Y-Aka, Q-BC, US, Eur.

3. A. Nuttallii Rob. -- Resembling A. lyrata but the leaves entire. Plant glabrous above, pilose below. Stem-leaves broader, oblong to oblanceolate, cuneate at base. Siliques divergent, about 2 cm long. Mid to late spring. Dry rocky places in the foothills. -- swAlta-BC, US.

Porsild 1951 would extend the range by about 600 miles to Withehorse in southwestern, Yukon. But the justifying specimen (CAN; DAO, photo) is rather unconvincing, being fragmentary, barely coming into flower and does not seem susceptible of uncontrollable identification.

4. A. hirsuta (L.) Scop. var. hirsuta (var. pyncocarpa (Hopkins) Rollins; A. ovata (Pursh) Poir.; A. pyncocarpa Hopkins) -- (Moutarde blanche, Tourette) -- Stiffly erect and generally resembling A. glabra, but not so tall, hairy up to about the middle, the siliques somewhat flattened and shorter, 3-5 cm long. Petals 3-5 mm long. Pod tightly appressed to the rachis. Late spring to early summer. Dry open places. -- Mack-Aka, NS, NB-BC, US, Eur -- Var. glabrata T. & G. -- Flowers larger, the petals 5-10 mm long. Pubescence coarser, not so abundant and generally restricted to the lower part of the plant. -- (swAlta) -sBC, nwUS.

The american plants (var. pyncocarpa) reputedly differ from the eurasian ones. The difference, if real, is not evident to us.

5. A. Drummondii Gray var. Drummondii -- Siliques stiffly appressed as in A. glabra and A. hirsuta, but wider and strongly flattened. Biennial, 4-10 dm high. Rosette leaves and base of stem malpighiaceous-pubescent, otherwise glabrous. Siliques 5-7 cm long., 1.5-2.2 mm wide. First half of summer. Dry places near the edge of woods. -- Mack-Aka, (L-NF), NS, NB-BC, US -- Var. connexa (Greene) Fern. -- Siliques broader, 2.2-3.0 mm wide. -- NF, seQ, swAlta-sBC, (US).

6. A. Lyallii Watson -- Similar to the preceding, but shorter, perennial, stellate-pubescent, and the siliques not always tightly appressed. Stem (1)-2-3-(5) dm high. Rosette leaves densely stellate-puberulent to nearly glabrous, the plant otherwise glabrous. Flowers mauve. Siliques (2)-3-5-(6) cm long, 2.0-2.5 mm wide, tightly appressed to somewhat divergent, often only 5 pods or less per plant. Mid summer. Rocky places at alpine and subalpine levels. -- swAlta-BC, US.

7. A. divaricarpa Nelson var. divaricarpa (A. brachycarpa (T. & G.) Britton) -- A middling and variable type, with long and narrow siliques spreading at a variety of angles. Stem 3-8 dm high, hirsute near base. Rosette and lower leaves stel-

late-puberulent, the plant otherwise glabrous except sometimes the tips of the sepals. Flowers usually mauve. Siliques 5-7 cm long, (1.0)-1.5-2.2 mm wide, strongly flattened. Fruits straight and ascending at about 45° in the typical variety. Late spring to early summer. Dry and well drained, open places. -- Mack-(Y-Aka), NB-BC, US -- Var. dacotica (Greene) Boivin (var. hemicylindrica Boivin, var. pinetorum AA.; A. Bourgovii Rydb.; A. Holboellii var. pinetorum AA.) -- Inflorescence more variable. Siliques straight to falcate, spreading to descending, sometimes spreading at a variety of angles in the same inflorescence, or even nearly pendulous. Pedicels always glabrous, always ascending to spreading, or at most gradually recurved, never abruptly reflexed at base. Flowers ascending to spreading at anthesis. Inflorescence sometimes somewhat secund. More common in our area. -- Mack-Aka, Q-BC, US.

Var. dacotica is the common phase in the western part of the range. Further east it is highly localized and almost entirely replaced by the typical phase.

8. A. Lemmonii Watson var. Lemmonii -- Siliques falcate and more or less spreading in a secund raceme. Perennial, 1-4 dm high, stellate-puberulent below. Siliques (2)-3-4-(5) cm long, 2.0-2.5 mm wide. Mid summer. Alpine shale slides and outcrops. -- swAlta-BC, wUS -- Var. drepanoloba (Greene) Rollins -- Siliques broader, 2.5-3.5 mm wide. -- swAlta, wUS.

9. A. retrofracta Graham var. retrofracta (A. Holboellii Horn. var. retrofracta (Graham) Rydb.) -- Pedicels abruptly reflexed at base and normally stellate-puberulent. Biennial, stellate-puberulent below. Rosette leaves somewhat longer than the stem leaves. Inflorescence commonly somewhat secund. Flowers mostly white, spreading to descending at anthesis. Pods 4-5 cm long, about 1 mm wide, pendent, straight. Late spring and early summer. Dry and open places. -- Mack-Aka, scQ-BC, US -- Var. Collinsii (Fern.) Boivin (A. Collinsii Fern.; A. Holboellii Horn. var. Collinsii (Fern.) Rollins) -- Stem hirsute near the base, the pubescence coarser and simple or at least less divided than that of the rosette leaves. More common and especially frequent on dry hillsides. -- Mack-Y, Q-BC, US -- Var. multicaulis Boivin -- Short-lived perennial. Many-stemmed. Rosette leaves about twice as long as the few stem leaves. Pods 5-6 cm long, about 1.5 mm broad. Pubescence as in var. retrofracta -- Y, Alta.

Var. retrofracta and var. Collinsii have been gradually filling out to each other's range and may eventually turn out to be sympatric phenotypes of no particular significance.

The extension by Boivin 1966 of the range of var. multicaulis to Alaska was apparently a mere lapsus calami.

Our species is often treated as so many varieties under A. Holboellii Horn., but the latter has much larger siliques, 2.0-2.5 mm wide, falcate, strongly flattened and descendent rather than pendent. Further it seems restricted to Greenland and reports from various other areas, including those from Bic, Quebec, were based on specimens of other species. Reports by Hitchcock

1964 Rollins 1941 and Hultén 1945 of typical Holboellii from Wash., B.C. and northward have not been investigated yet.

10. A. arenicola (Rich.) Gelert var. arenicola -- Similar to A. Nuttallii, but the basal leaves dentate and the pods coarser. Perennial, glabrous, 1-2 dm high. Stem leaves slightly fleshy, oblong to oblanceolate, cuneate at base. Raceme secund or not. Silique straight, ascending, (1)-2-(3) cm long, 1.5-2.5 mm wide. First half of summer. Arctic and subarctic sands and gravels. -- G-neK, nL, nQ,nwS -- Var. pubescens (Watson) Gelert-- Basal leaves and lower part of stem hirsute. -- (F)-K-eMack, nQ-nMan-nwS.

29. ERYSIMUM L.

TREACLE MUSTARD

Flowers yellow; silique not compressed; pubescence malpighiaceous, sometimes also partly stellate. Biennials or annuals.

a. Flowers purple; pods purplish 5. E. Pallasii

aa. Flowers yellow; pods green.

b. Petals 15-25 mm; pods 6-10 cm long 4. E. asperum

bb. Petals and fruits shorter.

c. Plants grayish-puberulent; petals 6-10 mm long.

d. Leaves with mostly 2-pronged

hairs 3. E. inconspicuum

dd. Mostly stellate with 3-5

branches 2. E. hieraciifolium

cc. Plant green; petals 3-5 mm long ..

..... 1. E. cheiranthoides

1. E. CHEIRANTHOIDES L. (Cheirinia cheiranthoides (L.) Link) -- Wormseed-Mustard, Treacle-Mustard (Herbe aux chantres) -- Tall, virgate, nondescript annual. Leaves lanceolate, entire or nearly so. Pedicels thin, about 1 cm long. The whole plant abundantly puberulent, yet remaining greenish. All summer. Disturbed soils. -- (seK)-Mack-Aka, NF, NS-BC, US, Eur, (Afr).

Reputedly native in Alaska (Hultén 1945) and in Saskatchewan (Breitung 1959). We are skeptical and note that the label data of the specimens at hand would hardly support this opinion.

2. E. HIERACIIFOLIUM L. (E. durum Presl & Presl) -- Very much like the next but the pubescence mainly stellate. Pods commonly appressed. Summer. Rare roadside weed: Stoughton -- NS, Q-O, S, Eur.

There is also a sight record for Moose Jaw but no substantiating specimens for such a critical identification.

European botanists will often recognize the segregate E. durum mainly on its slightly smaller flowers and entire leaves (sinuate in E. hieraciifolium). The distinction may not be a tenable one as we have noticed a number of intermediate specimens, combining the smaller flowers with the sinuate leaves, and originating from various parts of the European range, including Sweden. Our introduced plants are a closer match for these intermediates.

3. E. inconspicuum (Watson) MacM. var. inconspicuum (E. parviflorum Nutt.; Cheirinia inconspicua (Watson) Rydb.) -- Similar to the following and often growing with it, but generally smaller and the pods narrowly divergent. Siliques 2-5 cm long. Pubescence almost entirely of malpighiaceus hairs, with a few stellate (3 branches) hairs mixed in. Early to mid summer. Steppes and disturbed soils. -- Mack-Y, NS, NB-BC, US.

Our variety has seeds \pm 1 mm long. In fruit a var. coarctatum (Fern.) G.B. Rossbach may be distinguished by its larger seeds, 2 mm long or a bit less. Its siliques also average a bit longer. Var. coarctatum is a disjunct entity, being known from around the Gulf of Saint Lawrence and also from northern B.C. (at Taylor) to Alaska. All the material examined from Alaska belonged to var. coarctatum.

4. E. asperum (Nutt.) DC. var. asperum (Cheirinia aspera (Nutt.) Rydb.) -- Western Wallflower, Prairie-Rocket -- Very long, spreading and squarish pods. Grayish-puberulent throughout, 2-5 dm high. Leaves remotely dentate. The yellow flowers rather large for the family. Early summer. Rolling steppes and sandhills. -- Q-Alta-(BC), US.

Native with us, but only a casual adventive further east. Our typical phase may be contrasted with the following variety.

Var. angustatum (Rydb.) stat. n., E. angustatum Rydb., Bull. N.Y. Bot. Gard. 2: 171. 1901 has narrower leaves, (1)-2-3-(5) mm wide, and nearly all are entire. It is known only from Dawson and vicinity in Yukon. Reports from Alaska seem to be based on Yukon collections from the vicinity of Dawson.

5. E. Pallasii (Pursh) Fern. var. Pallasii -- The purple flowers large and showy; the pods half as long as the plant. Biennial, 1-2 dm high. Leaves linear, numerous, crowded. Petals 1-2 cm long. Siliques 6-10 cm long, ascending. Early summer. Shale and gravel slides. -- G-F, Mack-Y-(Aka, swAlta).

The alaskan var. bracteosum G.B. Rossbach is leafy-bracted in the lower part of the raceme(s).

30. ALYSSUM L.

ALYSSUM

Superficially resembling Lepidium, but the silicle compressed parallel to the partition. Petals white, entire.

a. Silicle stellate-pubescent 1. A. desertorum

aa. Glabrous 2. A. alyssoides

1. A. DESERTORUM Stapf (A. alyssoides AA.) -- Branchy annual, stellate-puberulent throughout, except the silicles. Sepals falling off before the silicle is fully grown. Pod about 3 mm wide, orbicular, very flat along the edge, but strongly convex nearer the center. Mid spring to late summer. Along roads and railways, rare. -- sMan-swAlta, nwUS, Eur.

2. A. ALYSSOIDES L. -- Closely resembling the first but the silicle stellate-pubescent, like the rest of the plant. Sepals persisting on the fruit until it is ready to shed its seeds. Early summer. Rare weed of waste places, first appeared in 1964 at Coleman. -- Q-O, swAlta-BC, US, Eur, (Oc).

31. BERTCREA DC.

Resembles Draba, but the white petals are bifid. No rosette.
ERYSIMUM

1. *B. INCANA* (L.) DC. -- Like a large, white-flowered *Draba*. Annual, 1-10 dm high, densely stellate-puberulent throughout including the fruits. Leaves entire. Silicle topped by a thin style, about 1/3-1/2 as long as the body of the fruit. Summer and fall. Roadsides and fields; locally abundant. -- NS, NB-S-(Alta)-BC, US, Eur.

The only Alberta report goes back to Groh 1944 and was based on an High River specimen which was returned to its collector, hence is not readily verifiable.

32. *BRAYA* Sternb. & Hoppe

Variable. Our species resembles an *Arabis* or *Erysimum* with white flowers and torulose siliques.

1. *B. humilis* (C.A. Meyer) Rob. var. *interior* (Böcher) Boivin -- Lowermost flower (or fruit) bearing a bract $\frac{1}{4}$ of the way up its pedicel. Tufted perennial up to 3 dm high. Leaves linear, the main ones remotely dentate. Flowers white and more or less purplish tinged. Silique straight or falcate, 1.5-3.0 cm long, about 0.5 mm wide or slightly broader. Style about $\frac{3}{4}$ mm long. Stigma $1\frac{1}{2}$ -2 times broader than the style. Around mid summer. Arctic shores and open sands and gravels. -- nO-nMan-- Var. *americana* (Hooker) Boivin (*B. Richardsonii* (Rydb.) Fern.) -- Bract about halfway up the pedicel. Leaves all or mostly entire. Siliques 1.0-2.5 cm long, about 1 mm wide. Style about 0.5 mm long. Stigma barely wider than the style. River gravels and roadsides in the mountains. -- (NF?), sAlta-(BC).

In a monograph of the genus by E.C. Abbe, *Braya* in Boreal Eastern America, *Rhodora* 50: 1-15. 1948, this species was subdivided in taxa termed "races", but unnamed and merely numbered. These taxa are somewhat confluent morphologically and not always readily defined, yet they are of restricted distribution and of some taxonomic and phytogeographical interest. As could be expected, the merely numbered races were soon to receive one or more names each. What is most remarkable is the wide variety of ranks used in naming a series of essentially comparable taxa; they range from form (*capitata*) to variety (*interior*) to subspecies (*arctica*) to species (*novae-angliae*). Two of these taxa were even placed into a segregate genus (*Torularia*). This wide range of usage reflects in part the lack of agreement among modern taxonomists on the definition of the various taxonomic categories currently in use. It may also reflect the indifference of some taxonomists to the philosophic justification of said categories. The most common type of indifference is that of the taxonomist who would call everything a species. However this latter attitude does not seem to have come into play in the present case.

All these segregates of *Braya humilis* have the same nature and the same value; logically it would seem highly desirable that they be rated as all of the same rank. Which rank in this case corresponds to our concept of variety. Hence the following transfers with the concordance to Abbe's races.

Var. *Abbei* (Böcher) stat. n., *B. novae-angliae* (Rydb.) Th. *Spr.* ssp. *Abbei* (Böcher), *Medd. Grøn.* 124, 7: 21. 1956; Race 4.

Var. americana (Hooker) stat. n., B. alpina Sternb. & Hoppe
var. americana Hooker, Fl. Bor. Am. 1: 65. 1830.

Var. glabella (Rich.) stat. n., B. alpina Sternb. & Hoppe
var. glabella Rich. ex Franklin, Narr. Journ., Bot. App. 743.
1823; Race 1.

Var. interior (Böcher) stat. n., B. novae-angliae (Rydb.)
Th. Spr. var. interior Böcher, Medd. Grön. 124, 7: 20. 1956;
Race 6.

Var. laurentiana (Böcher) stat. n., B. novae-angliae (Rydb.)
Th. Spr. var. laurentiana Böcher, Medd. Grön. 124, 7: 19. 1956;
Race 3.

Var. leiocarpa (Trautv.) Fern., Rhodora 39: 276. 1937;
Races 2 et 5.

Var. ventosa (Rollins) stat. n., ssp. ventosa Rollins, Rhodora 55: 114. 1954.

Comparable designations will now be available for these essentially comparable entities.

33. MALCOLMIA Br.

Similar to Hesperis but the stigmas back to back, decurrent on the entire style.

1. M. AFRICANA (L.) Br. (Macloviana africana sphalm.) -- Lowest silique borne ± opposite a normal leaf. Diffuse annual, puberulent through. Sepals and petals persistent until the fruit is about fully grown. Flowers violet or purple. Silique about 5 cm long, terete. Early summer. Cultivated and casually reseeding itself; doubtfully reported for Swift Current. -- (swS), US, Eur, (Afr).

34. HESPERIS L.

ROCKET

Style bifid at tip and the stigmas decurrent on the inner face of the lobes, thus the two stigmas facing one another. Otherwise, similar to Erysimum, but the flowers purple.

1. H. MATRONALIS L. -- Dame's Violet, Mother-of-the-Evening (Julienne des dames) -- Showy annual, tall and virgate, with large purple flowers. Commonly around 1 m high. Leaves dentate, rather large for the family. Petals 1.5-2.5 cm long. Fruit 6-10 cm long, thin, somewhat torulose, narrowly divergent. Summer and fall. Commonly cultivated and readily reseeding itself in open soil, sometimes in great abundance, invading shaded places. -- (Aka), NF, NS-BC, US, Eur.

35. MATTHIOLA Br.

Style more deeply bifid than in Hesperis, developing into a pair of horns at the summit of the mature fruit.

1. M. BICORNIS DC. -- Evening-Stock, Perfume-Plant -- Fruit ending in a pair of divergent and horn-like projections about 5 mm long. Similar to Hesperis matronalis, but more diffusely branched and the flowers and fruits sessile. Early

summer. Casual and fleeting escape from flower gardens: Saskatoon. O, S, Eur.

36. CONRINGIA Link HARE'S EAR MUSTARD

Siliques quadrangular, tapering to a short indehiscent and seedless beak.

1. *C. ORIENTALIS* (L.) Dum. (*Erysimum orientale* (L.) Br.)-- Hare's Ear -- Glaucous and glabrous annual, usually virgate, 3-8 dm high, with rather large, entire and clasping leaves. Leaves oblong, deeply amplexicaul, entire or subundulate at margin. Flowers pale yellow, almost white. Siliques about 1 dm long. First half of summer. Frequent weed of disturbed soils, rarely abundant. -- (G), NF, NS-(PEI)-NB-BC, US, Eur.

37. HALIMOLOBOS Tausch

Similar to *Arabis*, but the siliques is terete.

1. *H. virgata* (Nutt.) O.E. Schulz -- Abundantly hirsute and stellate throughout, except the terete siliques. Otherwise similar to *Arabis*. Petals 2.0-3.5 mm long, white. Pods 1-3 cm long, nearly erect on divergent pedicels. Spring and first half of summer. Steppes, rare: Bois  Coteau.√-- (Y), swS-seAlta, (US).

The Manitoba report of *H. mollis* (Hooker) Rollins is based on two fragments collected in early flowering and labeled Anderson, L. Winnipeg, Grand Rapide, Fort de traite, 17 June 1851 (CAN; DAO, photo). Because of the pubescence, the date of flowering, the direction of the pedicels, etc., we are of the opinion that these fragments belong to *Arabis divaricarpa*.

Coronopus didymus (L.) Sm. is reported from Banff, Alta., by R. Campbell, Can. Rec. Sc. 8: 172. 1900. This was repeated by Groh 1950. Most later authors have ignored the many papers by Campbell and his numerous additions and range extensions. And rightly so as nearly all his unusual reports and many of the run of the mill ones are based on errors of identification. Thus his reports of *Silene acaulis* and *Sibbaldia procumbens* from Wolseley, Sask. are based respectively on *Phlox Hoodii* (QK; DAO, photo) and *Potentilla concinna* (QK; DAO, photo). Other reports by Campbell were systematically ignored; too many of them border on the fantastic.

Order 41. RESEDALES

Like the 4 previous orders, the floral parts free except for the fused carpels. But the flower zygomorphic. Single family.

√A physiographic feature similar to the Coteau de Prairie and the Missouri Coteau; the northern edge, 200 to 2000 feet high, of a plateau which runs along the northern edge of the Cypress Hills east to the Big Muddy Lake, south to Plentywood in Montana.

72. RESEDACEAE (MIGNONETTE FAMILY)

Floral parts variable in number, mostly in 5's or 6's. Sepals not all the same size. The petals also of different sizes.

1. RESEDA L. MIGNONETTE

Petals palmately lobed from a scale-like basal portion.

Ovary (and fruit) incompletely closed at summit.

- a. Leaf entire in the lower half or third, pinnatipartite to bipinnatipartite above the middle....1. R. lutea
 aa. Leaf pinnatipartite to the base 2. R. alba
 1. R. LUTEA L. -- Dyer's Rocket, Mignonette (Grand'mère, Réséda sauvage) -- Leaf entire to trifid below the middle, trifid to much divided above. Tufted perennial. Perianth in 6's. Flowers yellow. Late spring to late summer. Cultivated and rarely escaped. -- O-S, BC, US, Eur.

We know of only one Saskatchewan collection, from Grenfell (SASK; DAO, photo). The earlier report by Groh 1944 from Trevarga was based on a specimen (DAO) since revised to R. alba.

2. R. ALBA L. -- Similar to the preceding but the leaf division of a more standard pattern. Perianth in 5's, but the carpels 4. Flowers white. Late summer. Rare garden escape. -- Q-S, BC, US, Eur.

Order 42. CARYOPHYLLALES

This and the next two orders have axile or central placentation; that is the ovules are borne, not along the edges of the carpels, but on a central column. In this Order the petals are usually present and the fruit is many-seeded. Leaves opposite, except some Portulacaceae.

- a. Sepals 3-5.
 b. Ovary 2-5 locular 73. Elatinaceae
 bb. Ovary essentially unilocular 74. Caryophyllaceae
 aa. Sepals 2. 75. Portulacaceae

73. ELATINACEAE (WATERWORT FAMILY)

Like the following family, but the ovary fully divided into 2-5 locules.

1. ELATINE L.

Inconspicuous and insignificant small plants growing on the mud. Wall of the fruit very thin and transparent, the seeds clearly distinct inside.

1. E. triandra Schkuhr var. americana (Pursh) Fassett (var. brachysperma AA.; E. americana (Pursh) Arnott) -- Leaves usually with a deep-red marginal dot at the end of each nerve. Stem less than 1 dm long. Leaves obovate to oblanceolate. Flowers axillary, inconspicuous, nearly always 3-merous. Fruit 1-2 mm across, subglobose. Seeds elongate, reticulate, the areoles hexagonal. Mid to late summer. Shallow water and mud flats.-- sMack, NB-Alta-(BC), US, (CA), eEur.

The eurasian var. triandra is a generally larger plant with mostly lanceolate leaves, the marginal notches usually deeper and the placentation more clearly axile. The latter is prac-

tically basal in our variety.

74. CARYOPHYLLACEAE

(PINK FAMILY)

The basic type of the order. The opposite leaves linked by transnodal lines of tissue or by pairs of stipules that are more or less fused 2 by 2 so that they usually look as if there was only 2 stipules to each pair of leaves. Seeds centrally borne. Ovary unilocular or partly 3-celled.

- a. Sepals free Group A
 aa. Sepals fused Group B

Group A

Both sepals and petals free.

- a. Stipules present.
 b. Axillary fascicles present in every axil,
 the leaves thus seemingly verticillate..... 5. Spargula
 bb. Axillary fascicles irregularly distributed,
 the leaves obviously opposite 6. Spargularia
 aa. Stipules lacking.
 c. Petals deeply bilobed or bifid, often
 appearing as if there were 10 petals.
 d. Capsule dehiscent into 6 to 8 valves...1. Stellaria
 dd. Capsule dehiscent at the apex only
 and by 10 teeth2. Cerastium
 cc. Petals (4)-5, entire or emarginate.
 e. Styles (and valves) as many as the
 sepals, usually 5 3. Sagina
 ee. Style (and valves) only 3 and fewer
 than the sepals 4. Arenaria

Group B

Sepals fused, but the petals free.

- a. Calyx subtended by 1-3 pairs of bracts 11. Dianthus
 aa. Calyx not bracted at base.
 b. Calyx-lobes 2-3 cm long, much longer
 than the tube7. Agrostemma
 bb. Calyx-lobes much smaller and shorter
 than the tube.
 c. Calyx with 5 main nerves.
 d. Flower 1 cm long or less 10. Gypsophila
 dd. Much larger 12. Saponaria
 cc. Calyx with 10-35 nerves.
 e. Calyx with 10 main nerves ending
 alternately in the lobes and sinuses.
 f. Styles essentially 3 8. Silene
 ff. Styles 5, exceptionally less....9. Lychnis
 ee. Calyx with 20-35 nerves.
 g. Calyx glabrous or glandular, the
 lobes symmetrical 8. Silene

- gg. Calyx hirsute, not glandular,
somewhat asymmetrical at the
mouth 12. Saponaria

1. STELLARIA L. CHICKWEED, STARWORT

Herbs, often weak and tangled, with 5 bifid, white petals.
Styles 3. Capsule opening by 3-(4) bifid valves.

- a. Flowers in the axils of green leaves or bracts..... Group A
aa. Inflorescence bracteolate, the bracts membranous
or membranous-margined Group B

Group A

Flowers solitary and axillary or terminal, or borne in cy-
mes, the latter leafy or somewhat bracteolate, but with green
bracts.

- a. Leaves oblong to broadly ovate, the main ones
petiolate.
b. Petiole about half as long as the blade1. S. media
bb. Much shorter, only 1-2 mm long.
c. Leaves broadly ovate and less than
1 cm long 2. S. obtusa
cc. Narrowly ovate and larger; sepals
longer and acute 3. S. crispa
aa. Leaves sessile.
d. Flowers in a terminal, leafy cyme.
e. Petals about as long as to a little
longer than the sepals5. S. crassifolia
ee. Much shorter, or even lacking 7. S. calycantha
dd. Flowers solitary.
f. Plant densely glandular-pubescent
throughout 4. S. americana
ff. Foliage glabrous or slightly puberulent.
g. Leaves fleshy, oblong to ovate...6. S. humifusa
gg. Leaves lanceolate to linear.
h. Flowers mostly appearing axil-
lary; leaves of branches only
half as large as the stem-leaves..
..... 5. S. crassifolia
hh. Flowers clearly terminal; branch-
leaves not reduced 10. S. laeta

Group B

Flowers in bracted cymes, the bracts membranous or at
least membranous-margined.

- a. Inflorescence terminal, of only 1-(3) flowers ..
..... 12. S. Edwardsii
aa. Flowers more numerous.
b. Pedicels ascending to erect; the central
flowers on more stiffly erect pedicels

- than the others 11. S. longipes
 bb. Inflorescence more open, with some of
 the pedicels, especially those of the central
 flowers, spreading to deflexed.
 c. Petals about as long as, to slightly longer
 than, the sepals 9. S. longifolia
 cc. Absent or at least smaller, about 2/3 as
 long as the sepals or shorter.
 d. Leaves irregularly and rather long-
 ciliate towards the base; petals
 mostly present 7. S. calycantha
 dd. Eciliate; petals absent..... 8. S. gonomischia

1. S. MEDIA (L.) Cyrillo -- Chickweed (Cresson, Mouron
des oiseaux) -- Leaves broadly ovate, the main ones petiolate,
 the others [±] sessile. Petiole about half as long to nearly as
 long as the blade. Leaf commonly 1 cm wide. Stem pilose in
 lines. Inflorescence diffuse to well defined, leafy to bracte-
 olate, the bracts green. Sepals pilose. Petals short. Early
 summer to early frosts. Forming tangled carpels in waste pla-
 ces and on cultivated ground. -- G, Mack-Aka, L-SPM, NS-BC, US,
 Eur, Oc.

2. S. obtusa Eng. -- Forming a tangled carpet and much li-
 ke a diminutive S. media. Glabrous. Leaves mostly around 5 mm
 long, on pedicels mostly around 1 mm long. Flowers solitary in
 the manner of the next. Sepals mostly oblong, 1.5-2.5 mm long,
 broadly acute to rounded at tip. Petals minute or lacking. La-
 te spring and early summer. Wet places and shores, rare: Blair-
 more. -- sAka, swAlta-seBC, wUS.

3. S. crispa C. & S. -- Also resembles the first, but the
 leaves not quite so broad and nearly sessile. Glabrous. Stem
 elongated. Branches few. Leaves gradually smaller. Flowers
 remote, solitary, seemingly axillary and only one to a node. Se-
 pals lanceolate, 2.5-3.5 mm long, sharply acute. Petals lacking.
 Late spring to mid summer. Damp woods and shores in Waterton.
 -- (swY)-Aka, (swAlta)-BC, US.

4. S. americana (Porter) Standley -- Glandular-puberulent
 throughout. Low, rather leafy and few-flowered. Leaves rather
 large, oblong, sessile. Mid summer. Alpine shale slides in
 Waterton. -- swAlta, (US).

5. S. crassifolia Ehrh. -- Rather nondescript and often
 misidentified. Leaves lanceolate, in two sizes, those of the
 branches only half as large. Variable in habit, but glabrous
 and slightly fleshy. Flowers in leafy cymes or terminal and
 solitary, often appearing axillary through the development of
 a subterminal branch. Petals about as long to slightly longer
 than the sepals. First half of summer. Shores and damp pla-
 ces. -- (F)-K-Aka, L-(NF, NS)-PEI-BC, US, Eur -- F. gemmificans
 Norman (S. gracilis Rich.) Bulbiferous in the axils of the up-
 per leaves. -- (K), Q-S-(Alta). Perhaps the normal autumnal
 phase.

Two collections (CAN, DAO) reported by Turner 1949 as S. sitchana Steudel have since been revised to S. crassifolia.

6. S. humifusa Rottb. var. humifusa (var. suberecta Boivin) -- Fleshy and matted, the small leaves ovate to oblong. Forming a tangled carpet. Glabrous. Leaves all about the same size, commonly 4-6 mm long. Flower solitary, terminal. Petals about as long as the sepals. Mid summer. Sandy to rocky seashores. -- G-Aka, L-(NF)-SPM, NS-Q-(neO)-nMan, Eur.

On the Pacific Coast and on Prince Edward Island the typical variety is partly replaced by a var. oblongifolia Fenzl, more or less erect and with longer and narrower leaves, the latter being ± lanceolate and mostly 8-15 mm long.

7. S. calycantha (Led.) Bong. var. calycantha (var. isophylla Fern., var. latifolia Boivin; S. borealis Big.) -- Flowers in a leafy cyme, the petals small. Very variable in size. Leaves slightly ciliate towards the base; internodes sometimes very finely scabrous; otherwise the whole plant glabrous. Leaves elliptic to linear. Flowers in a single terminal cyme. Petals about 2/3 as long as the sepals, or shorter and vestigial. Sepals 1.5-3.0 mm long, or up to 4 mm in fruit. First half of summer. Damp places. -- G, (K)-Mack-Aka, L-NF-(SPM, NS-PEI)-NB-BC, US, Eur -- Var. floribunda Fern. -- Inflorescence ample and the flowers rather numerous. Leaves becoming gradually smaller into the inflorescence, the ultimate bracts scarious or green with a wide scarious margin. -- (NF), NS-(PEI)-NB-Man, (BC), US.

S. graminea L. is not improbable for our area. Resembles typical S. calycantha, but all the inflorescence bracts are membranous and the larger sepals are usually ciliate. Tending to be erect and (2)-4-(8) dm high. Leaves lanceolate or somewhat narrower. Cyme very diffuse. Sepals 4-6 mm long. However, previous reports of this weed from our area do not seem justified. H.H. Marshall at Morden (DAO) has been revised to S. longipes; J.M. Gillett at Churchill (DAO) has been revised to S. crassifolia and W. Krivda at The Pas (CAN; DAO, photo) is typical S. longifolia. We have found no Roseisle specimen in the private herbaria of de Ruyck and Champagne; they held only collections from Riding Mountain and Pine Falls which we have revised to S. longipes. Finally, a York Factory collection distributed as S. graminea has also been revised to S. longifolia, while the collection reported from Lake Waskesiu (SASK) was revised to S. longipes in 1956.

8. S. gonomischa Boivin (S. umbellata AA.) -- Resembles S. calycantha, especially var. floribunda, but eciliate and mostly about 1 dm high and the upper stem internode (or lower inflorescence internode) rather elongate, often half as long as the height of the plant. Stem leaves abruptly passing into the inflorescence bracts, the latter many times shorter. Cyme single, terminal and diffuse, the internodes mostly longer than the pedicels, the ultimate bracts scarious-margined. Flowers small and apetalous, the sepals mostly 2 mm long. Capsule less than twice as long as the sepals. Mid summer. Wet spots in subal-

pine forests; Waterton. -- swAlta, wUS.

The related asiatic S. umbellata Turcz. has a more congested inflorescence, subumbellate in the manner of Holosteum umbellatum L., capsules larger, at least twice as long as the sepals, etc. We have seen no matching specimen from North America and despite a number of reports of S. umbellata for Canada, all specimens examined proved to belong to other species, mostly S. calycantha.

9. S. longifolia Muhl. var. longifolia (S. graminea AA.)-- Rather nondescript and easily confused with S. calycantha and the next two species. The upper pair of stem-leaves usually subtends 1-(2) elongate branches that will often overtop the inflorescence. (Such a branch is always lacking in S. calycantha and S. longipes). The leaves are narrow, linear to linear-lanceolate, up to 1.5-5.0 mm wide, usually with parallel margins, sometimes slightly wider towards the middle. (In the other species, and especially so in S. laeta, they tend to be broadest below the middle and tapering to the tip). Inflorescence bracteolate throughout. (Leafy at base in S. calycantha var. floribunda). Sepals 2.8-4.0 long, not ciliate. Petals longer than the sepals. (Shorter in S. calycantha). Capsule greenish to straw-coloured or pale brown. Mid spring to late summer. Forming tangled masses in wetish places. -- (NF)-SPM, NS, NB-BC, US -- Var. atrata J.W. Moore (S. atrata (J.W. Moore) Boivin) -- Sepals smaller and ciliate. Capsule purplish black. Generally smaller throughout. Leaves mostly 0.5-1.0 mm wide, the largest rarely up to 2 mm. Sepals 2-3 mm long. The usual phase northward. -- Mack-Y, (Q)-O-Man, Alta, US -- Var. eciliata Boivin (S. atrata (J.W. Moore) Boivin var. eciliata Boivin) -- As var. atrata, but the sepals eciliate. The common phase westward. -- (seK)-Mack-Aka, Q-BC.

10. S. laeta Rich. var. laeta -- A small species with a single (rarely 2-3) terminal flower. Usually less than 1 dm high. Stoloniferous and forming dense to lax carpets. Leaves narrowly ovate to narrowly lanceolate, ± canaliculate, all about the same size or the upper reduced, but not reduced to membranous bracts. Not glabrous, but at least the sepals ciliate and also commonly puberulent on back; the stem often pubescent. Generally similar to the next two species but for the reduced inflorescence. First half of summer. Loose sands. -- G-F-(K)-Mack-Aka, nQ, nMan, (swAlta)-BC, (Eur) -- Var. altocaulis (Hultén) Boivin (S. Hulténii Boivin; S. monantha Hultén) -- Sepals not ciliate. Plant entirely glabrous or sometimes somewhat puberulent. Loose gravels and shales. -- G-Aka, L-NF, neNB-nMan, swAlta-BC, wUS.

11. S. longipes Goldie (S. graminea AA.; S. stricta Rich.) -- Commonly a very glaucous herb with strongly contrasting dark purple capsules. Glabrous perennial, about 2 dm high, stoloniferous, green to glaucous. Leaves somewhat carinate, narrowly lanceolate to linear, broadest near the base and gradually tapering to a very sharp point. Inflorescence open, occupying the upper half of the plant, bracteolate, the bracts membranous.

Pedicels ascending to erect, the central one longer and stiffly erect. Petals longer than the sepals. Early to mid summer. Forming tangled carpets on moist sands or gravels. -- seF-(K)-Mack-Aka, L-(NF), NB-Alta-(BC, US) -- Var. subvestita (Greene) Pol. (S. subvestita Greene) -- Stem ± pubescent. Leaves glabrous to slightly pubescent. -- (K-Y)-Aka, Q-O-(Man)-S-Alta-(neBC) -- Var. arenicola (Raup) Boivin (S. arenicola Raup) -- Capsule straw-coloured, the valves becoming strongly recurved and reflexed. Sand dunes of lake Athabaska. -- nWS.

12. S. Edwardsii Br. var. Edwardsii (S. ciliatosepala Trautv.) -- Somewhat intermediate between S. laeta and S. longipes, the plant small and the inflorescence reduced as in the former, the pedicels with membranous bracts as in the latter. Sepals finely ciliate. Early summer. Sands and gravels. -- G-F-(K-Y)-Aka, nMan, (Eur) -- Var. crassipes (Hultén) Boivin (S. crassipes Hultén) -- Sepals glabrous and not ciliate. -- G-F-(K-Mack, L-NF), nQ-nWS, BC, (Eur).

Reports of S. Alsine from Manitoba were based in part on collections from Gillam and Churchill (DAO) now revised to S. calycantha and on a York Factory specimen (QK; DAO, photo) which belongs to S. crassifolia f. gemmaficans.

2. CERASTIUM L.

MOUSE-EAR-CHICKWEED

Rather similar to Stellaria, but the styles 5 and the cylindrical capsule opening by 10 short teeth.

- a. Annual; capsule 2-3 times as long as the calyx ..
 5. C. mutans
- aa. Perennial; capsule usually shorter.
- b. All leaves but the upper pair subtending an axillary fascicle.
- c. Foliage green 3. C. arvense
- cc. White-tomentose 4. C. tomentosum
- bb. Axillary fascicles few, or more often lacking.
- d. Leaf and stem pubescence similar, either soft pilose or glandular-pilose to nearly glabrous 1. C. alpinum
- dd. Pubescence of two types: the leaves stiffly hirsute and ciliate, the stem soft pilose to glandular-puberulent 2. C. vulgatum

1. C. alpinum L. var. alpinum (var. glanduliferum AA., var. strigosum Hultén; C. arcticum Lange, var. vestitum Hultén; C. Beerlingianum C. & S., var. grandiflorum (Fenzl) Hultén; C. terrae-novae Fern. & Wieg.) -- Perennial with numerous short basal branches forming dense ground cover. Mostly 1 dm high. Pubescence variable, commonly long pilose, varying to glandular or to nearly glabrous. Leaves obovate to narrowly lanceolate, their pubescence similar to that of the stem. Flowers generally few and rather large. Inflorescence bracts usually green. Sepals (3.5)-5.0-8.0-(10.0)mm long. Petals commonly $1\frac{1}{2}$ -2 times

the length of the sepals. First half of summer. Arctic and subarctic gravels. -- G-Aka, L-(NF), Q-NS-(Alta-BC, Eur) -- Var. *capillare* (Fern. & Wieg.) Boivin (C. *Earlei* Rydb.) -- Pubescence shorter; the glandular hairs only 0.1-0.3 mm long on the pedicels. Alpine outcrops and shale slides. -- swAlta-BC, wUS.

2. *C. VULGATUM* L. (var. *holosteoides* Fries, var. *hirsutum* Fries; *C. holosteoides* Fries; *C. triviale* Link) -- Sometimes seeming to run into the preceding, but generally taller and of more diffuse growth, with scarious-margined bracts and smaller flowers. Biennial or short-lived perennial, (1)-2-(4) dm high. Leaves ± lanceolate, uniformly hirsute and ciliate, or nearly glabrous. Stem pubescence different, soft pilose to glandular-pubescent, often densely so, or nearly glabrous. Inflorescence with bracts usually scarious or broadly scarious-margined. Sepals (4)-5-(7) mm long. Petals commonly just a little longer than the sepals. Early to mid summer. More or less ubiquitous weed, not frequent in our region. -- G, Y-Aka, L-SPM, NS-BC, US, (SA), Eur, (Afr, Oc).

3. *C. arvense* L. (var. *viscidulum* Greml; *C. campestre* Greene) -- Whiteweed (Mouron d'alouette) -- Flowering stems appearing very leafy as all leaves, except the upper pair, subtend either a short branch or an axillary tuft of small narrow leaves. Otherwise a perennial generally resembling *C. vulgatum* but densely glandular-puberulent throughout. Leaves marcescent, narrowly lanceolate to linear. Petals about $1\frac{1}{2}$ times as long as the sepals. Late spring to mid summer. Dry open places. -- (G, K)-Mack-Aka, L-SPM, NS-BC, US, Eur.

4. *C. TOMENTOSUM* L. -- Snow-in-Summer, Dusty Miller (Barbette, Argentine) -- Foliage as the preceding, but the whole plant densely white-tomentose. Inflorescence stiff and open, reminiscent of *Stellaria longipes*. Petals white, large, fading brownish-black. Early summer. Cultivated for its whitish foliage and sometimes spreading to nearby meadows: Matlock. -- NS-PEI, Q-Man, BC, (US), Eur.

5. *C. nutans* Raf. var. *nutans* (var. *occidentale* Boivin) -- Annual. Viscid-pilose, erect, often many-stemmed. Inflorescence with green bracts. Pedicels rather long, geniculate just below the fruit. Petals variable, from $1\frac{1}{2}$ the length of the sepals or shorter to lacking. Capsule 2-3 times longer than the sepals. Summer. Shores and wet shaded ground, rarely weedy. -- sMack, swQ-neBC, US -- Var. *brachypodum* Eng. (*C. brachypodum* (Eng.) Rob.) -- Inflorescence more compact, the pedicels not geniculate, but often reflexed, about as long as the capsule, or shorter. Rare and perhaps a mere extreme of variation: Gil-lam, Falcon Lake, Consul. -- Man-S-(Alta), US.

Var. *brachypodum* is not recognized by Hitchcock 1964. There seems to be good justification for his stand except that in Canada, on the basis of the collections examined to date, the two varieties are far from being sympatric.

3. SAGINA L.

PEARLWORT

Similar to *Stellaria*, but the petals not bifid, rather entire or merely emarginate. Sepals (4)-5. Styles as many as

the sepals. Capsule opening by (4)-5 entire valves.

- a. Bulbiferous; flowers larger, the petals about twice as long as the sepals 3. S. nodosa
- aa. Not bulbiferous; petals about as long as, to shorter than, the sepals.
 - b. Annual with an evanescent rosette 1. S. decumbens
 - bb. Tufted perennials with a well developed and marcescent rosette.
 - c. Capsule $1\frac{1}{2}$ -2 times as long as the calyx 2. S. saginoides
 - cc. Capsule shorter, slightly longer than the calyx; plant smaller 4. S. nivalis

1. S. DECUMBENS (Ell.) T. & G. -- Inconspicuous and very thin annual. Usually less than 1 dm high. Petals usually insignificant. Flowers alternate in a somewhat racemose inflorescence. Resembling a small Arenaria serpyllifolia in fruit, but the leaves linear. Early summer. Footpaths (?) on light soil. Very rare weed from the eastern U.S.: Cypress and Hand-hills. -- (Aka), NB-O, S-BC, US.

Probably native in B.C., but more likely introduced elsewhere north of the U.S.A.

The floral mery is variable and on that basis the species is often subdivided into a tetramerous S. decumbens and a pentamerous S. occidentalis. The Canadian material examined does not fall readily into this dichotomy; some were pentamerous (Montreal, Ottawa, Prince Rupert and Victoria), or tetramerous (Cypress Hills), while some collections (St. John and Hand Hills) were made up of both types.

2. S. saginoides (L.) Karsten -- Small and inconspicuous perennial with a taproot and tending to form a small cushion of basal or near basal filiform leaves. Glabrous. Stems short, only a few cm long, bearing only 1-(3) terminal flowers. Sepals usually scarious-margined. (Mid summer?) Wet open ground in alpine habitats; rare or overlooked: Rockies. -- (G)-F, (Y)-Aka, L-NF, NB-Q, Alta-BC, US, Eur.

Not to be confused with the somewhat similar species of Arenaria. The latter are glandular-puberulent at least on the peduncles.

3. S. nodosa (L.) Fenzl var. nodosa -- Bulbiferous, the bulblets small, usually about 1 mm long and mostly made of a cluster of 4 fleshy leaflets. Short-lived perennial, glabrous or slightly glandular-puberulent at the top of the pedicel. Rosette leaves long filiform, much longer than the stem leaves. Bulblets few to numerous, terminal or axillary, often \pm replacing the flowers. Flowers few, terminal. Summer. Sandy or rocky shores of large bodies of water. -- (G-K)-Mack, (L)-NF, NS-S-(Alta), US, Eur.

Further east, and primarily in maritime regions, there occurs a var. pubescens Mert. & Koch, more or less glandular-puberulent, at least on the pedicels.

4. S. nivalis (Lindl.) Fries var. caespitosa (J. Vahl) Boivin (S. caespitosa (J. Vahl) Lange) -- Similar to S. saginoides, but generally smaller and the sepals usually with a deep purple border. Inconspicuous short-lived perennial, 1-2 cm high, tufted from a dense rosette. Glabrous. Stems short, usually shorter than the rosette leaves, bearing a single flower on a long pedicel. (Early summer?). Arctic shores and polygonic soils. -- G-K, L, nQ, (nMan, US), Eur.

Var. nivalis is more widely distributed in arctic regions; it is a taller plant, the upper part of the stem overtopping the basal foliage.

4. ARENARIA L.

SANDWORT

Stypes mostly 3 and fewer than the 5 sepals as in Stellaria, but the petals entire, as in Sagina. Capsule opening by 3 entire or bifid valves.

- a. Leaves with a well developed limb Group A
- aa. Limb very narrow Group B

Group A

Limb narrowly lanceolate to broadly ovate, more than 1 mm wide.

- a. Inflorescence bracts very small, scarious-margined.
 - b. Sepals obtusish to rounded; leaves pilose below along the midnerve 5. A. lateriflora
 - bb. Sepals somewhat acuminate; leaves glabrous below 6. A. macrophylla
- aa. Inflorescence leafy or the leaves gradually reduced to green and leaf-like bracts.
 - c. Glabrous and very fleshy sea-coast plant 12. A. peploides
 - cc. Little if at all fleshy, and at least the pedicels puberulent.
 - d. Annual; puberulent throughout ..
..... 1. A. serpyllifolia
 - dd. Perennial; leaves glabrous 2. A. humifusa

Group B

Leaves linear or subulate to filiform, usually 0.5-1.0 mm wide.

- a. Sepals obtuse or more often rounded at summit.
 - b. Leaves 1-6 cm long.
 - c. Inflorescence glandular 3. A. capillaris
 - cc. Glabrous 4. A. congesta
 - bb. Leaves 1 cm long or less 7. A. laricifolia
- aa. Sepals clearly acute to acuminate.
 - d. Leaves spinescent and recurved 11. A. Nuttallii
 - dd. Leaves not spiny, straight and more appressed.

- e. Flowers 2 or more in a cymose inflorescence.
 f. Usually glabrous; most stem-leaves subtending an axillary fascicle... 8. A. stricta
 ff. Glandular-puberulent at least in the inflorescence; axillary fascicles few or none 10. A. verna
 ee. Flowers solitary, terminal.
 g. Sepals pale green 8. A. stricta
 gg. Deep red 9. A. Rossii

1. A. SERPYLLIFOLIA L. -- Sandweed -- Annual. Densely puberulent, retrorsely so on the internodes, slightly scabrous and usually many-stemmed. Leaves ovate, subsessile, less than 1 cm long. Petals half as long as the sepals. Inflorescence elongating in fruit, often becoming somewhat racemose with the fruits more or less alternate. Late spring to early summer. Rare weed of cultivated fields: Kamsack, Tisdale. -- NS-O, S, BC, US, Eur.

2. A. humifusa Wahl. (A. cylindrocarpa Fern.) -- Capsule deep brown above. Peduncle and upper part of stem finely puberulent. Small, matted, stoloniferous and slightly fleshy perennial. Leaves small, lanceolate to ovate. Flower solitary, terminal. Early summer. Coastal sands and gravels. -- (G-F)-K-Mack-(Y)-Aka, (L)-NF-(SPM), Q, nMan, (Alta-BC, Eur).

3. A. capillaris Poiret var. americana (Maguire) Davis (A. formosa AA.) -- Leaves longest, the lower ones mostly 2-4 cm long. Glabrous below, finely glandular above. Densely tufted with the leaves mostly near the base. The numerous and sparsely leafy stems 1-2 dm high. Cyme often corymbiform with the lateral pedicels successively much shorter. First half of summer. Montane and low alpine grassy slopes and rock slides. Rockies. -- swAlta-BC, nwUS.

The more northern typical variety is glabrous in the inflorescence.

4. A. congesta Nutt. var. lithophila (Rydb.) Maguire (var. prolifera Maguire; A. lithophila Rydb.) -- Much resembling the preceding, but glabrous, except for the finely ciliate lower leaves. Inflorescence more congested. Pedicels tending to be shorter than the flowers. Late spring and early summer. Dry montane prairies: Cypress Hills, Sweetgrass Buttes and southward. -- swS-seAlta.

South of us, the typical variety has a still more congested inflorescence, the flowers being sessile or nearly so.

5. A. lateriflora L. (Moehringia lateriflora (L.) Fenzl) -- Commonly a simple herb with a single seemingly lateral inflorescence. Long stoloniferous and forming large loose colonies. About 1 dm high and nearly always with 1-(2) inflorescences which arise terminally but usually appear to be lateral due to the growth of a single branch from one of the upper axils. Leaves elliptic to narrowly lanceolate, more or less pubescent, at least ciliate at margin and densely pilose below along the mid-nerve. Inflorescence bracteolate, with 1-3 flowers. Sepals

2-3 mm long, rounded at tip. Late spring and early summer. Very common forest species. -- seK-Aka, L-SPM, NS-BC, US, Eur.

6. A. macrophylla Hooker (Moehringia macrophylla (Hooker) Torrey) -- Resembling the preceding, but with larger flowers. Leaves commonly larger and more acute, sometimes scaberulous at margin and minutely puberulent above along the midnerve, otherwise quite glabrous. Sepals 3.5-4.5 mm long, ± acute. Late spring. Dry, open, rocky places, rare -- Mack, L, Q-O, nS, BC, US, (Eur).

7. A. laricifolia (L.) Rob. var. occulta (Ser.) Boivin -- (A. arctica Steven; A. obtusiloba (Rydb.) Fern.; A. sajanensis W.) -- Sepals obtuse and somewhat cucullata at tip. Loosely to densely tufted perennial. Glandular-puberulent above and usually nearly glabrous below, but at least the leaves ciliolate. Flowers small to large, tending to be solitary. Petals as long as, to longer than, the sepals. Mid summer. Forming small to large mats on rock slides and exposed alpine habitats. -- F-Aka, swAlta-BC, nwUS, Eur.

In our variety the upper leaves and bracts are normally glabrous or ciliate. The typical phase of southern Europe tends to be larger, laxer, and its bracts and upper leaves are as densely puberulent or glandular as the rest of the inflorescence.

8. A. stricta Mx. var. litorea (Fern.) Boivin (A. dawsonensis Britton; A. uliginosa Schleicher; Sabulina dawsonensis (Britton) Rydb.) -- Loosely tufted perennial with narrow leaves and numerous axillary tufts; the very open inflorescence occupying most of the height of the plant. Glabrous throughout. Usually 1-2 dm high. Leaves mostly 1-nerved or sometimes weakly 3-nerved. Pedicels very unequal, the central one being $1\frac{1}{2}$ -2 times as long as the lateral. Sepals 3-5 mm long. Petals included. Early to mid summer. Cliffs and dry, open places. -- (seK-Aka), L-(NF), Q-Alta-(BC, ncUS) -- Var. puberulenta (Peck) C.L. Hitchc. (A. tenella Nutt.) -- Somewhat glandular-puberulent in the inflorescence. Reported for southwestern Alberta. -- (swAlta)-BC, nUS -- Var. uliginosa (Schleicher) Boivin (A. uliginosa Schleicher) -- Generally smaller and fewer-flowered. Glabrous. Foliage mostly restricted to the lowest 1-2 cm. Pedicels subequal or solitary. Sepals 2.5-3.0 mm long, acute at summit. First half of summer. Wetter spots in arctic tundra. -- (G)-F-K-(Mack-Aka, L), Q-nMan, (Eur).

Not to be confused with certain similar species of Sagina. The latter have more numerous styles and valves and the sepals are rounded at tip.

Our three varieties are usually treated as species, but we find that they are very closely related and intergrade to some extent.

9. A. Rossii Br. var. columbiana Raup -- Forming dense cushions pinned with numerous solitary white flowers with red sepals. Glabrous. Leaves 2-5 mm long. Pedicels usually reddish and commonly short, rarely up to 2 cm long. Flower terminal. Petals somewhat shorter than the deep red sepals. Mid summer. Alpine rock slopes. -- Mack-Y, (swAlta)-BC, (nwUS) --

Var. apetala Maguire -- Petals lacking or very small and very narrow, less than half as long as the sepals -- (Y), swAlta-eBC, (nwUS).

10. A. verna L. (A. rubella (Wahl.) Sm.; Sabulina propinqua (Rich.) Rydb.) -- Rather resembling a small A. stricta. Smaller, less than 1 dm high. Glandular-puberulent throughout or at least above. Leaves 3-nerved, the lateral nerves often nearly as strong as the middle one. Stem leaves bearing few, if any, axillary fascicles. Pedicels shorter, not exceeding 1.5 cm long. Summer. Dry and open montane or alpine places in the Rockies and Cypress Hills; also northward in subarctic and arctic regions. -- G-Aka, L-NF, Q-BC, US, Eur.

The phenotype with the petals shorter than the sepals is commonly segregated as A. rubella.

The Bell collection from York Factory (QK; DAO, photo) has been revised to A. stricta var. uliginosa.

11. A. Nuttallii Pax var. Nuttallii -- Leaves divergent-falcate and ending in a sharp spinescent point. Otherwise resembling A. stricta by its inflorescence and acute sepals, but A. laricifolia by its mode of growth and densely carpeting habit. Densely glandular-puberulent throughout. Mid nerve very strong, nearly half as wide as the whole leaf. Sepals usually acuminate into pungent tips. First half of summer. Talus slopes in the mountains -- (swAlta)-BC, wUS.

Three other varieties are known to occur further south. The series may be keyed out as follows:

- a. Petals included, shorter than the sepals.
- b. Leaves falcate and mostly 1 cm long or slightly less var. Nuttallii
- bb. Straight and shorter, 5-8 mm long ..
..... var. gracilis (Gray) Rob.
- aa. As long or longer than the sepals.
- c. Sepals 3.5-4.5 mm long...var. gregaria (Heller) Jepson
- cc. Flowers larger, the sepals 5.5-6.5 mm long, the petals about as long ..
..... var. fragilis (Mag. & Holmgr.) C.L. Hitchc.

12. A. peploides L. var. diffusa Horn. -- A very fleshy maritime plant. Stoloniferous and forming a loose carpet of stems 1 dm high or less. Glabrous. Leaves with a paler and finely crenulate margin. Fruit large, solitary, globular, somewhat less than 1 cm across. First half of summer. Sandy or gravelly beaches at high tide level. -- G-nMack-(nY)-nAka, L-NF, nQ-nMan.

Provided the Old World variations are ignored, our american specimens can be readily divided into three fairly satisfactory geographical varieties: a smaller and more northern var. diffusa, a larger west coast var. major Hooker, and a fleshier and more leafy east coast var. robusta. However the european material is also very variable and we do not see clearly how to relate the typical and other transatlantic material to our cisatlantic va-

riations. We have therefore ignored all the paleocean material in our statements of distributions. Not a very satisfactory solution intellectually, but the only practical one in the present stage of our knowledge.

5. SPERGULA L.

SPURREY

Stipules present. Otherwise much as in Sagina, with 5 sepals, 5 styles and entire petals. Capsule dehiscent by 5 valves.

1. S. ARVENSIS L. (var. sativa (Boem.) Rchb.) -- Povertyweed, Spurrey (Grippe, Herbe de poudre) -- Filiform leaves numerous, seemingly verticillate, but actually opposite and subtending axillary fascicles. Annual, glabrous to glandular, usually many-stemmed. Inflorescence leafless, merely bractedate. Pedicels becoming reflexed right after flowering, the full grown plants thus tangling very readily. Summer and fall. Infrequent weed of crops and waste places: Edmonton region; more doubtfully elsewhere. -- G, sMack-Y-(Aka), NF-SPM, NS-O-(Man-S)-Alta-BC, US, SA, Eur.

Var. sativa is often distinguished rather arbitrarily as a more glandular type with non-papillose seeds. The nomenclature of the distinction is unsound as var. sativa is based on the same type as S. arvensis.

6. SPERGULARIA J. & C. Presl

Stipules present. Otherwise much as in Arenaria, with 5 sepals but only 3 styles and the petals entire. Capsule dehiscent by 3 valves.

1. S. marina (L.) Gris. (var. leiosperma (Kindb.) Gürke; S. diandra (Guss.) Boiss.; S. salina J. & C. Presl; S. sparsiflora (Green) Nelson) -- Each pair of leaves with only one pair of deltoid stipules. Annual, glandular-puberulent and viscid throughout. Leaves linear with few, if any, axillary fascicles. Inflorescence leafy, imperfectly cymose, tending to become racemose. Fruiting pedicels mostly reflexed. Petals much shorter than the sepals and often pinkish. Seeds variable, less than 1 mm wide, brown to blackish, smooth to papillose, sometimes with a peripheral wing. Summer. Native on alkaline shores; sporadically weedy. -- sMack, (NF)-SPM, NS-BC, US, (CA, SA), Eur, (Afr).

7. AGROSTEMMA L.

Calyx lobes prolonged into leaf-like appendages. Similar to Lychnis, but the 5 styles opposite the petals.

1. A. GITHAGO L. -- Corn-Cockle, Corn-Campion (Nielle des blés) -- Calyx lobes very long, overtopping the petals, similar to the leaves and about half as long as the latter. Densely strigose annual, stiffly erect. Leaves long-linear. Flower large and showy, purple red, on a very long peduncle. All sum-

mer. Old fashioned weed of cereal crops, now practically eliminated. -- (Aka), NS-PEI-(NB)-Q-S, BC, US, Eur.

8. SILENE L.

CATCHFLY, CAMPION

Styles only 3, otherwise as in Lychnis. Capsule dehiscent by 6 teeth.

a. Stemless and forming compact cushions 7. S. acaulis
aa. Stem elongate and obvious.

b. Calyx densely glandular-pubescent.

c. Calyx less than 1 cm long 9. S. Menziesii

cc. Larger, clearly over 1 cm long.

d. Calyx with about 35 nearly equal

longitudinal nerves 1. S. conoidea

dd. With 10 nerves only.

e. Weedy annual 3. S. noctiflora

ee. Native perennial with shorter

calyx lobes 8. S. Scouleri

bb. Calyx glabrous except for the ciliate lobes.

f. Calyx up to 8 mm long, with

10 simple nerves.

g. Inflorescence a dense thyrse 6. S. sibirica

gg. Flower few in an open

cyme 2. S. antirrhina

ff. At least 10 mm long, with \pm 20 main

nerves.

h. Calyx nerves strongly reticulate

above the middle 4. S. Cucubalus

hh. Nerves weakly branched and

barely reticulate 5. S. Cserei

1. S. CONOIDEA L. -- Calyx conic-lanceolate at flowering. Annual, viscous-glandular throughout. Calyx 2-3 cm long, with about 30-35 nerves, the internerves membranous, the lobes \pm 1 cm long. Petals purple, large. Capsule pyriform. Mid summer. Rare weed of field crops and elevator areas: Lacombe. -- Alta, (US), Eur.

2. S. antirrhina L. -- Sleepy Catchfly -- The upper internodes with a heavy glutinous zone; these zones at first pale green, soon turning purple-black and becoming very conspicuous. Thin and wiry annual, glabrous above, retrorse-scaberulous below, the leave scaberulous at margin. Calyx 6-8 mm long, with ciliolate lobes. Early summer. Open sandy places. -- NB-BC, US, (CA, SA, Eur).

Frequent from Roche-Percée eastward and it may also be common across the northern parts of our area, but as of yet we have seen only two other collections from west of Manitoba: Lake Athabaska and Fort Chippewyan.

3. S. NOCTIFLORA L. -- Sticky Coockle (Fleur de nuit)-- Large white flowers snowy in the evening, closed and inconspicuous in the daytime. Annual, glandular-pubescent throughout. Leaves \pm lanceolate. Calyx 2.0-2.5 cm long, the lobes nearly

1 cm long. Early to mid summer. Crop fields and roadsides. -- (G), Aka, NF, NS-BC, US, Eur.

Not to be confused with Lychnis Loveae. The latter is a perennial with shorter calyx lobes.

4. S. CUCUBALUS Wibel var. CUCUBALUS (S. latifolia (Miller) Britton & Rendle; S. vulgaris Garcke) -- Blaadder-Campion, Maiden's Tears (Pétards, Péteux) -- Calyx with \pm 20 main nerves and strongly reticulate above the middle. Nearly glabrous perennial, 3-8 dm high. Leaves \pm lanceolate, commonly 1-2 cm wide. Inflorescence variable, usually cymose. Calyx lobes tomentulose at tip. Summer. Infrequent weed of cultivated ground, roadsides and waste places. -- NF, NS-BC, US, Eur.

Many authors prefer S. vulgaris but as pointed out by Hitchcock 1964, this was based on the illegitimate Behen vulgaris and the epithet vulgaris takes date only from the legitimate publication of Silene vulgaris Garcke 1869. See the note under Art. 72 of the Code. S. Cucubalus Wibel 1799 is much earlier as a legitimate epithet. Hence our nomenclatural choice.

European authors often recognize a wide selection of variants. One of them, var. latifolia (Rchb.) Beck from Central Europe, has been reported as introduced south of our borders. It is a generally larger plant with leaves 2-3 cm wide and calyxes 1.5-2.0 cm long.

This and the next are quite obviously different in the field, but when we came to write our key, we were surprised to find how difficult it is to select a convenient and reliable key character. This awkwardness in communicating one's knowledge in writing does not in any way impair the distinctiveness of the two entities.

5. S. CSEREI Baumg. -- Much like the preceding, but biennial, larger, more fleshy, glaucous and with a conspicuous fork in the inflorescence. Showy, 5-15 dm high. Leaves elliptic, to lanceolate, mostly 2-4 cm wide. The two main branches of the inflorescence 1-3 dm long and bearing their flowers somewhat laterally. Early summer. Open ground, mainly on railway cinders, and still spreading rapidly. -- Q-BC, US, Eur.

6. S. SIBIRICA (L.) Pers. -- All stem leaves subtending copious axillary fascicles. Tufted perennial, more or less scabrous, especially the leaves. Flowers numerous in a rather dense, elongate inflorescence. Calyx small, about 5 mm long. Fruit stipitate, the stipe about $1\frac{1}{2}$ mm long. (Early summer?). Local weed of cultivated fields, invading grasslands.--cS, eEur.

Known from Maymont, Duck Lake, Bladworth, Nokomis and Bethune.

7. S. acaulis L. var. excapa (All.) DC. -- Forming dense cushions in alpine habitats and very conspicuous when speckled with flowers. Perennial with a strong taproot and a tightly branched caudex. Flower purple, solitary, borne just above the cushion on a short peduncle. Early summer. Rocky tundra and talus slopes: Rockies and lake Athabaska region. -- G-Aka, L-SPM, eNS, Q, nWS-swAlta-BC, US, Eur.

Divisible into three intergrading varieties, the typical one being eurasian. In ours the calyx is 3-6 mm long and mostly longer than its peduncle. In the more western var. subacaulescens (F.N. Williams) Fern. & St. John in the larger calyx is commonly 7-10 mm long and usually shorter than its peduncle. We must admit that we find much of the Yukon and Alaska specimens to be rather intermediate.

8. S. Scouleri Hooker var. Scouleri -- Native alpine species similar to some species of Lychnis. Tufted perennial, glandular-viscous above, reflexed-puberulent below, mostly 3-4 dm high. Leaves up to 5-10 mm wide. Flowers clustered, on pedicels rarely over 1 cm long shorter than the calyces. Calyx 10-15 mm long, the lobes 2-4 long. Early summer. Montane prairies. -- swAlta-swBC, nwUS -- Var. Macounii (Watson) Boivin (S. Parryi (Watson) Hitchc. & Mag.) -- Smaller, mostly 2-3 dm high. Leaves 2-5 mm wide. Pedicels variable, the one of the terminal flower 1-3 cm long. -- swAlta-sBC, nwUS.

9. S. Menziesii Hooker var. Menziesii -- Second smallest species. Stoloniferous, 1-3 dm high, glandular-pubescent out. Leaves narrowly to broadly oblanceolate. Flowers few, small. Calyx only 5-9 mm long, the nerves inconspicuous. Capsule purple-black. Late spring to early summer. Wooded ravines and shores, rarely weedy. -- sMack-Y-(Aka, wcMan)-sS-BC, US.

To the southwest of us there is a var. Dorrii (Kellogg) stat. n., S. Dorrii Kellogg, Proc. Cal. Ac. 3: 44, 1863, with the glandular pubescence of the lower part of the stem much shorter, minute, and much more sparse. And to the northwest a var. Williamsii (Britton) Boivin which differs mainly by its larger calices, 9-11 mm long.

A mention of S. dichotoma Ehrh. by Budd 1957 and 1964 was apparently based on R.E. Anderson, Melfort, Sask., July 18, 1951 (SCS: DAO, photo), but this sheet is a specimen of Lychnis Loveae.

9. LYCHNIS L.

CAMPION

A basic type with fused calyx but free petals. Styles normally 5, alternate with the petals. Calyx with 10 main nerves.

Treatment approximate as most of our specimens are on loan to a specialist at the moment.

- a. Leaves more than 1 cm wide.
 - b. Flowers red in a compact inflorescence ..
 - 2. L. chalconica
 - bb. Flowers white in a very open cyme 1. L. Loveae
- aa. Leaves narrower, 7 mm wide or less.
 - c. Flowers nodding, purple.
 - d. Calyx 2-3 times as long as wide 5. L. attenuata
 - dd. Calyx ovoid to subglobular 6. L. apetala
 - cc. Flowers erect, white.

- e. Flowers closed and the petals included
in the daytime 4. L. pudica
- ee. Flowers open and the petals well exerted
in the daytime.
f. Calyx 8-10 mm long 3. L. Drummondii
ff. Calyx 10-13 mm long 7. L. triflora

1 X. L. LOVEAE Boivin (L. alba AA.; Melandrium album AA.)--
White Campion, White Cockle (Compagnon blanc, Passe-jacée) --
Flowers showy, open in daytime, closed at night. Coarse and
sticky perennial with a widely diffused inflorescence. Calyx
at first cylindrical, then distended by the fruit and becoming
nearly globular. Calyx lobes 3-6 mm long. Petals white. Sum-
mer. Roadsides and cultivated fields; a hybrid of L. alba X
L. rubra, escaped from cultivation. -- Aka, NS-BC, US, Eur.

Seems clear that our plant is not the european L. alba,
white-flowered and opening at night, but rather a garden hybrid
of L. alba X L. dioica. The L. dioica parent is red-flowered,
opening in the daytime, while our plants are white-flowered and
open in the daytime.

A report of Silene dichotoma Ehrh. by Budd 1957, 1964, was
based on a collection of Lychnis Loveae from Melfort (SCS; DAO,
photo).

2. L. CHALCEDONICA L. -- Scarlet Lychnis, Maltese Cross
(Croix de Jérusalem, Lampette de Calcédoine) -- Flowers brick-
red in a compact corymbiform cyme. A coarse hirsute perennial.
Capsule long-stipitate, the stipe at least half as long as the
body of the fruit. Mid summer. Sometimes cultivated and tend-
ing to escape to nearby ditches and fields. -- PEI, Q-S, BC,
(US, Eur).

3. L. Drummondii Watson var. Drummondii (L. affinis AA.;
Wahlenbergella Drummondii (Watson) Rydb.) -- Similar to Silene
Scouleri but with 5 styles, and the calyx shorter. (Early sum-
mer?). Alpine habitats. Reported for the Rockies of Alberta,
but these reports are doubtful and may be based on a Silene or
on the following species. -- (swAlta), US.

Two of Watson's specimens have been examined. One from
Weber Valley, Utah (HUH), has white and exerted petals; it is
considered typical of the species. The other is from Uintas
(HUH) and has the characteristic purplish petals of the follow-
ing variety.

L. Drummondii Watson var. heterochroma var. n. Petalis
exsertis, lamina purpurea. Type: C.L. Porter 4650, Medicine
Bow Mountains near Keystone, 9000 ft., July 14, 1948 (DAO). Pa-
ratypes from Wyoming, Utah and Colorado.

See the next species for more on the typification of this
name.

4. L. pudica Boivin (L. Drummondii AA.; Wahlenbergella
Drummondii AA.) -- Calyx closed and the petals included in day-
time. A rather inconspicuous perennial, virgate, 3-6 dm high,
glandular-puberulent. Flowers few, opening at night. Calyx
cylindrical. Seed small and wingless. Petals white, slightly

exserted at night. Late spring to mid summer. Steppes, prairies and Pine woods. -- (Mack), Man-BC, US.

L. Drummondii Watson -- As a doubtful synonym Watson cited Silene Drummondii Hooker and the two names are usually treated as synonyms but two quite different species are actually involved. Watson was quite aware of discrepancies between the two taxa and in his text he pointed out differences between his Lychnis and Hooker's Silene. Since Watson expressed a clear doubt about the synonym he quoted, it seems best that Watson's name be typified by the specimens which he had at his disposal. These belong to the Rocky Mountain element of the western U.S. for which the name is currently used. This is the Silene-like type with conspicuous petals. The other element is the L. pudica of our text.

5. L. attenuata Farr (L. apetala L. var. attenuata (Farr) C.L. Hitchc.) -- Similar to the following and often confused with it. Petals slightly exserted. Pubescence sometimes purplish throughout, but usually white throughout except on the calyx nerves. Stem lower, 5-10 cm high. Calyx narrower, narrowly ovoid to narrowly ellipsoid. Mid summer. Alpine rock slides: Rockies. -- swAlta-seBC -- F. glabra (Regel) Boivin -- Herbage glabrous. -- (swAlta).

6. L. apetala L. var. arctica (Fries) Cody -- Flower nodding, the petals included. Perennial, 0.5-2.0 dm high, not viscous, but with purplish pubescence. Flower terminal, nearly always solitary. Petals purple. Calyx ovoid to subglobose, erect in fruit. Seed broad, with a large inflated wing. (Early summer?). Wet tundra and shores of arctic streams. -- (G)-F-Mack-(Y)-Aka, (nL), nQ, nMan.

In the eurasian var. apetala the petals are white and a bit longer, almost exserted.

7. L. triflora Br. var. elatior (Regel) Boivin (L. affinis AA.; L. Gillettii Boivin) -- Very glutinous tufted perennial. Glandular pubescent throughout. Mostly with 3 flowers on elongate pedicels. Flowers white and open in the daytime and the calyx \pm oblong. Seed over 1 mm wide, with an inflated wing. (Early summer?). Arctic gravels. -- (F-K)-Mack-Aka, nO-nMan.

In the more widely distributed and more northern var. triflora the calyx is bigger, 1.2-1.5 cm long, and the seeds smaller 1.0-1.2 mm wide. Specimens from northern Manitoba, including those reported as L. affinis, have a calyx only 0.8-1.2 mm long but the seeds 1.2-1.8 mm wide and belong to var. elatior.

The application of the name L. triflora was discussed by Boivin 1959.

A report of Melandrium affine (J. Vahl) Hartm. from the Rockies of Alberta by Porsild 1959 has not been investigated.

10. GYPSOPHILA L.

Similar to Saponaria but the capsule dehiscent by 4 valves instead of 4 teeth.

a. Petals \pm 1 cm; annual 3. G. elegans

aa. Much smaller, perennial.

b. Inflorescence glabrous 1. G. paniculata

bb. Densely glandular 2. G. acutifolia

1. G. PANICULATA L. -- Baby's Breath (Oeillet d'amour)-- Tall perennial with a diffusely branched inflorescence of numerous small flowers. Commonly 5-8 dm high and glabrous throughout or at least in the inflorescence. Stem strongly inflated at the nodes. Sepals petaloid, with a large purple midnerve and broad white margins. Petals white, 2-3 mm long, slightly exceeding the sepals. Mid summer to early fall. Cultivated and sometimes invading adjacent grassland in great numbers. -- Q-sManseBC, US, Eur.

2. G. ACUTIFOLIA Fischer (G. perfoliata var. latifolia AA.) -- Similar to the preceding but glabrous below while glandular-puberulent in the inflorescence. Leaves larger and thicker. Calyx somewhat petaloid. Petals deep pink, about 5 mm long. Mid to late summer. Local escape from cultivation: Calgary. -- Alta, (Eur).

Our specimens seem to fit the description in the Fl. URSS. 7: 757-8. 1936 except for the flower colour. However we notice that Fournier 1952 describes the flowers as being indifferently white or pink.

3. G. ELEGANS Bieb. -- Smaller annual with larger flowers. Glabrous throughout, 2-5 dm high. Calyx greenish with white margins. Petals white, up to 1 cm long. Summer. Cultivated and sometimes reseeding itself on roadsides and waste places: Hoosier, Edmonton, Ft. Sask. -- (Aka), Q,swS-Alta, (US, Eur).

11. DIANTHUS L.

Calyx closely subtended by 1-3 pairs of leafy bracts. Otherwise similar to Saponaria.

a. Leaves 7-20 mm wide 1. D. barbatus

aa. Only 2-4 mm wide 2. D. sylvestris

1. D. BARBATUS L. -- Sweet William, French Pinks (Jalousie, Oeillet de poète) -- Inflorescence congested into a compact terminal corymbiform cyme as in Lychnis chalconica, but the latter is hirsute with scabrous leaves. Glabrous except for the finely ciliate or scabrous-margined leaves and bracts. Inflorescence somewhat involucreted with spinescent leaves. Bracts long-attenuate into a long stiff point. Petals white to pink, drying dark red. First half of summer. Cultivated and a casual roadside weed: Morden, Mossy Portage, Waterton. -- Q-O-(Man), Alta-BC, US, Eur.

2. D. SYLVESTRIS Wulfen -- Wood-Pink (Oeillet sauvage) -- Flower solitary or only 2-3 together. Bracts 1/4 to 1/3 as long as the glabrous calyx. Calyx with 20-40 nerves. Flower pink, showy. Late summer. Cultivated and rarely becoming weedy: Fort Saskatchewan. -- cAlta, (Eur).

12 SAPONARIA L.

SOAPWORT

Similar to Lychnis and Silene, but the styles normally only 2 and the capsule opening by 4 teeth. Calyx with 5 or 20 longitudinal nerves.

- a. Calyx cylindric, with 20 nerves 1. S. officinalis
 aa. Calyx wing-angled on the 5 nerves 2. S. Vaccaria

1. S. OFFICINALIS L. -- Bouncing Bet, Soapwort (Herbe à savon, Savonnière) -- The large leaves rather clearly 3 nerved. Quite showy perennial, 5-8 dm high, stoloniferous and forming large colonies. Hirsute in the inflorescence, glabrous below. Calyx cylindric, slightly asymetric, with two lobes almost completely fused and one sinus more deeply cut than the others. Flowers usually pink, often double. Summer. Cultivated and sometimes invading banks and roadsides. -- NS-BC, US, Eur.

2. S. VACCARIA L. (Vaccaria segetalis (Necker) Garcke; V. vulgaris Host) -- Cowherb, Cow-Cockle (Blé de vache, Herbe au veau) -- Calyx produced into 5 deep green, winged ridges, with each of the 5 nerves running on the top of a ridge. Glabrous and slightly glaucous annual with connate leaves. Inflorescence very open. Petals pale to deep pink. Summer. Casual weed in grain crops and around elevators. -- Y-(Aka, NS, NB-Q)-O-Alta-(BC, US), Eur -- F. GROHII Boivin -- Flowers white. Local. -- Man-S.

75. PORTULACACEAE

(PURSLANE FAMILY)

Rather unusual family by having only 2 sepals or only 2 calyx lobes. Other floral parts are in 3's, or 4's or 5's. Otherwise resembling the Caryophyllaceae.

- a. Stem very branchy 2. Portulaca
 aa. Stem simple or nearly so, or the plant scapose.
 b. Stem leafy 1. Claytonia
 bb. Leaves all basal, the scapes merely bracteolate 3. Lewisia

1. CLAYTONIA

SPRING-BEAUTY

Sepals 2, persistent, enveloping the 3-valved capsule.

- a. Leaves alternate.
 b. Leaves ovate to lanceolate 1. C. parviflora
 bb. Leaves linear.
 c. Annual; petals white 3. C. linearis
 cc. Perennial with superficial leafy stolons; petals pink, larger 2. C. Bostockii
 aa. Leaves opposite.
 d. Leaves mostly basal; the root a huge taproot 6. C. megarrhiza
 dd. All or mostly cauline.
 e. Leaves only two 5. C. caroliniana

ee. More numerous and many times

smaller 4. C. fontana

1. C. parvifolia Moç. (Montia parvifolia (Moç.) Greene) -- The tufted stems elongate and becoming very thin towards the tip. Basal leaves numerous, fleshy. Stem leaves remote, narrower and rapidly much smaller. Old stems decumbent and rooting at the nodes. Flowers pink, few, in a terminal raceme which is often congested into an umbel. Summer. Wet rocks below timberline: Waterton. -- seAka, swAlta-BC, wUS.

2. C. Bogstockii Pors. -- Resembling the following, but perennial with leafy superficial stolons. Petals pink, \pm 1 cm long. Wet places. (Spring?). Reported for northern Manitoba.-- Y-Aka, (nMan).

3. C. linearis Douglas (Montia linearis (Douglas) Greene; Moniastrum lineare (Douglas) Rydb.) -- Annual with 2-3 long-linear leaves. Sometimes tufted or with 1-2 branches. Petals white, about as long as the sepals. Late spring. Wet mossy places in the mountains; Cypress Hills and Twin Butte. -- swS-BC, US.

4. C. fontana (L.) R.J. Davis (Montia lamprosperma Cham.) -- Blinks, Indian Lettuce (Petit cresson) -- A small and slightly fleshy herb with opposite and oblanceolate leaves mostly \pm 1 cm long. Shallow-rooted annual in tangled colonies. Leaves ternerved, the two lateral nerves submarginal, meeting at the tip of the leaf and anastomosing with the median. Flowers few or solitary, on strongly arched peduncles. Summer. Cold springs in maritime regions: Churchill. -- (G-F)-K-(Mack), Aka, (L-SFM, NS-NB)-Q-nMan, BC, US, (CA, SA), Eur, (Afr, Oc).

5. C. caroliniana Mx. var. lanceolata (Pursh) Watson -- Tufted herb from a deeply buried corm. Stem bearing two sessile, lanceolate leaves and a terminal raceme of delicate flowers. Petals white to pink, about 1 cm long. Late spring and early summer. Mountain meadows and coniferous forests: Cypress Hills and Rockies. -- swS-BC, nwUS.

Many other varieties are known. The following occur in the western U.S.A.: var. sessilifolia Torrey has longer and narrower leaves; var. flava (Nelson) stat. n.; C. flava Nelson, Un. Wyo. Publ. Bot. 1: 142. 1926 has orange yellow flowers; var. chrysantha (Greene) stat. n., C. chrysantha Greene, Leaflet Bot. Obs. Crit. 2: 45, 1910 also has yellow flowers but broader leaves; var. Peirsonii (Munz & Johnston) stat. n., C. lanceolata Pursh var. Peirsonii Munz & Johnston, Bull. Torr. Bot. Club 49: 352. 1923 has a foreshortened and umbelliform inflorescence.

6. C. megarrhiza Parry -- Densely tufted herb from a huge taproot. Basal leaves numerous and crowded, suborbicular to obovate. Stem leaves petiolate, narrower. Inflorescence \pm overtopping the leaves. Petals white, nearly 1 cm long. Mid summer. Alpine summits and rock slides: Rockies -- swAlta-BC, wUS.

2. PORTULACA L.

PURSLANE

Ovary semi-inferior. Capsule circumcissile.

1. P. OLERACEA L. -- Purslane, Pusley (Pourpier sauvage, Porcelaine) -- A very fleshy weed with the stem and branches spread out on bare ground. Very antagonistic to the usual herbarium-making processes; gradually shedding its leaves, resisting for about a month and turning into a brittle blackened skeleton before giving up. Leaves alternate, spatulate. Main branches tending to be subopposite. Flowers, small, yellow. Late summer. Infrequent weed of bare ground, gardens and cultivated crops. -- NS-(PEI)-NB-BC, US, Eur.

3. LEWISIA Pursh

Ovary superior. Sepals persistent. Capsule circumcissile and also dehiscent at top.

1. L. pygmaea (Gray) Rob. var. pygmaea -- A rosette of somewhat fleshy, long-linear leaves arising from a fleshy taproot. Scapes with two opposite bracts and long overtopped by the leaves. Petals white to pink, up to 1 cm long. First half of summer. Alpine meadows in Waterton. -- swAlta-BC, US.

To the southwest of us it grades into a var. nevadensis (Gray) Fosberg with longer sepals, 5-12 mm long, and usually larger leaves.

Order 43. POLYGONALES

A reduced type from the Caryophyllales, the fruit being reduced to a single seed. Flower typically 3-merous.

- a. Leaves alternate or verticillate 76. Polygonaceae
 aa. Leaves opposite 77. Illecebraceae p. 117

76. POLYGONACEAE

(BUCKWHEAT FAMILY)

Most genera in this family have large stipules united into a cylindrical sheath at each node. This sheath is termed "ocrea". Petals lacking, but the sepals often petaloid. Fruit an achene.

- a. Leaves all basal or essentially so.
 b. Flowers in clusters subtended by a verticillate involucre 2. Eriogonum
 bb. Panicle not involucreted 4. Oxyria
 aa. Stem leafy.
 c. Uppermost leaves in a verticil of about 3 leaves 1. Koenigia
 cc. Leaves all alternate.
 d. Fruit wingless or sometimes the outer tepals winged dorsally 6. Polygonum
 dd. Fruit winged.
 e. Wings formed by the 3 inner and enlarging tepals 3. Rumex

ee. Wings borne directly on the achene, the sepals remaining small.

- f. Sepals and stamens 4; wings 2..... 4. Oxyria
- ff. Sepals and stamens 6; wings 3..... 5. Rheum

1. KOENIGIA L.

Resembling Polygonum, but the stipules not fused into a sheath and the flowers somewhat reduced. Sepals and stamens 3.

1. K. islandica L. -- Small to minute annual with a pair of basal leaves, one or a few alternate stem leaves and a terminal verticil of usually 3 leaves. Flowers small, mostly in a terminal cluster. Mid summer. Wet and more or less bare ground. -- G-K-(Mack-Y)-Aka, L, nQ, (swAlta-neBC, wUS), Eur.

We have yet seen no specimens from Alberta or B.C. and consider that the reports from those areas are questionable.

2. ERIOGONUM Mx.

UMBRELLA-PLANT

Stipules lacking. Flowers in clusters, each cluster subtended by a cupulate involucre. Clusters often gathered in umbels. Often semi-shrubby.

a. Flower clusters gathered in ± secund racemes..1. E. cernuum
 aa. Inflorescence umbellate.

b. Inflorescence a simple umbel of clusters, subtended by a verticil of reduced bracts.

c. Leaves ovate to suborbicular..... 3. E. ovalifolium

cc. Leaves lanceolate to narrowly linear.

d. Leaves in dense rosettes..... 5. E. androsaceum

dd. Leaves merely subbasal in crowded pairs 2. E. multiceps

bb. Umbel compound and subtended by a verticil of leaf-like bracts.

e. Bracts of the umbel lanceolate and

ascending 4. E. flavum

ee. Bracts spatulate and drooping..... 6. E. umbellatum

1. E. cernuum Nutt. -- Flower clusters on somewhat reflexed pedicels and in ± secund racemes. Leaves suborbicular, whitish-tomentose below, not so densely tomentose above. Leaves borne in a somewhat elevated rosette with a few alternate leaves below the rosette. Ramification of the inflorescence rather elaborate: first verticillate, then dichotomous, then racemose. Bracts small. Flower clusters small and whitish. Second half of summer. Open sands, rare: Abbey, Webb, Empress, Writing-on-Stone. -- swS-sAlta, US.

2. E. multiceps Nees -- Leaves not quite crowded into a rosette but separated by short internodes and ± clearly opposite. Grayish-white tomentose throughout. With a woody taproot and a branched caudex, also woody and buried. Leaves oblanceolate to linear, paler below. Inflorescence a simple umbel of clusters. Bracts very small to elongate. Flowers pinkish. First half of

summer. Eroded clays in badlands, where it acts as a soil binder. -- swS, (seBC), ncUS.

3. E. ovalifolium Nutt. -- Silver-Plant -- Forming compact cushions of white leaves. Taproot, branched caudex and marcescent leaves as in the following. Leaves ovate to suborbicular, white-tomentose on both faces. Flowers yellow in a dense umbel, often tinged pink. Mid summer. Talus slopes in the mountains. -- swAlta-seBC, US.

4. E. flavum Nutt. var. flavum -- Much in evidence in early summer on hillsides, a cushion-forming herb with umbells of yellow flowers. Taproot and caudex woody, the caudex branches few and densely clothed with the blackened remnants of old leaves. Leaves lanceolate, white-tomentose below, green and tomentose to villous above. Scape tomentose. Early summer. Near the top of hills, bluffs and coulées. -- swMan-sBC, US -- Var. Piperi (Greene) M.E. Jones (E. Piperi Greene) -- Not quite so densely pubescent: the scape merely villous and the hairs not tangled. Leaves villous above. Not a clear cut variation, but often replacing the type in the mountains: Rockies. -- swAlta-seBC, nwUS.

5. E. androsaceum Bentham -- Forming compact cushions of discolour leaves. Mode of growth as in the preceding, but the leaves smaller, about 1 cm long, linear-oblongate, white-tomentose below. Scape lower, less than 1 dm high. Inflorescence a simple umbel of clusters. Flowers yellow to deep red. Before mid summer. Alpine rock slides: Rockies. -- swAlta-seBC, nwUS.

6. E. umbellatum Torrey (E. subalpinum Greene) -- The woody caudex creeping on the ground and with obvious internodes, thus a carpet forming species. Leaves broadly oblanceolate, white-tomentose below, green and nearly glabrous above, clustered in numerous rosettes. Scapes 1-3 dm high. Inflorescence compound, subtended by a verticil of spatulate and drooping bracts which are somewhat smaller than the leaves. Flowers yellow. First half of summer. High montane and low-alpine on open rocky ground. -- swAlta-sBC, wUS.

3. RUMEX L.

DOCK, SORREL

Fruit with 3 wings, the 3 inner sepals enlarged and persistent to form those 3 wings. Achene hidden between the wings. Mid-nerve of the wings (or valves) often thickened into a seed-like grain or tubercule. Ocrea conspicuous as in Polygonum. Fruiting pedicel often with a thickening termed "articulation".

a. Fruit very large and showy, 1-3 cm wide..... 1. R. venosus

aa. Fruit much smaller.

b. Flowers dioecious; leaves mostly hastate or sagittate.

c. Leaves long cuneate at base 14. R. paucifolius

cc. Leaves hastate or sagittate.

d. Sepals small, about 1 mm long,

less than 2 mm long in fruit..12. R. Acetosella

- dd. Sepals and valves longer 13. R. Acetosa
- bb. Flowers mostly or all perfect; leaves hardly, if at all, hastate or sagittate, mainly cuneate to cordate.
- e. Wing margin produced into a few elongated acicular lobes.
- f. Inflorescence moniliform 10. R. dentatus
- ff. Inflorescence dense and continuous 11. R. maritimus
- ee. Wings entire to merely erose or denticulate.
- g. Pedicel not articulated or the articulation not thickened and \pm vestigial.
- h. Valves without grains... 5. R. occidentalis
- hh. Each valve with a large grain 7. R. orbiculatus
- gg. Pedicel with a thickened articulation Group A

Group A

Fruit borne on an articulated pedicel. Flowers all or mostly perfect. Fruit middle-size, without acicular lobes.

- a. Fruit with (1)-3 large grains; each at least 1/5 the width of the valves.
- b. Usually tufted and ascending at an angle, with all stem leaves subtending a branch or an axillary tuft 2. R. salicifolius
- bb. Tall virgate herbs; axillary tufts and branches none or few and poorly developed below the inflorescence.
- c. Valves entire to shallowly toothed... 8. R. crispus
- cc. Valves conspicuously and sharply toothed 9. R. stenophyllus
- aa. Fruit without grains or with only 1 small grain.
- d. Valves rather cordate, commonly about 4 mm wide 3. R. fennicus
- dd. Valves larger, somewhat reniform and mostly 6-8 mm wide.
- e. Leaves lanceolate to linear 4. R. longifolius
- ee. Much broader, triangular-cordate ..
..... 6. R. confertus

1. ~~R. venosus~~ R. venosus Pursh -- Wild Begonia, Sour Greens -- Showy sand species with a panicle of large, coloured fruits. Stoliferous and decumbent, the stem 1-3 dm long. Leaves entire, slightly fleshy, broadly lanceolate. Fruit yellow or pink to deep red. Valves reniform, entire, 1-3 cm wide. Late spring, shedding its fruits before mid summer. Sandy and semi-open soils. -- sMan-Alta, US.

2. R. salicifolius Weinm. var. angustifolius Meisner (R. mexicanus Meisner var. angustifolius (Meisner) Boivin, var. Eriangulivalvis (Danser) Lep.: R. pallidus Big.; R. triangulivalvis Rech. f.; R. utahensis Rech. f.) -- Most obviously different in the field by its habit: all the stem-leaves subtending branches or axillary tufts. Stems 3-10 dm high, tufted, \pm ascending. Leaves 1-(2) dm wide, linear-lanceolate, entire, thickish. Panicle open. Valves 3-4 mm long, 2.5-3.0 wide, triangular to triangular-deltoid, somewhat dentate in the lower half. Grains 3, rarely only 1, exceptionally none, about 2 mm long, up to 1 mm wide. First half of summer. Wet places and sloughs, sometimes weedy. -- sMack, NF-SPM, NS-BC, US.

Very variable, much divided and subjected to many name changes. It is not easy to arrive at a satisfactory classification of its more significant types. Many phenotypes have received varietal or specific names, but most such entities are local or sporadic variants of no particular interest and we have relegated them to synonymy. In our present understanding of the series, only one geographical variation occurs in our area. But three other varieties are to be found east, west and south of us, respectively as follows.

Around Hudson Bay, a var. subarcticus (Lep.) stat. n., R. subarcticus Lep., Nat. Can. 82: 191. 1955 with smaller leaves, less than 1 dm long, purplish inflorescence, moniliform racemes and tardily developing grains.

To the west of us the typical var. salicifolius, including R. sibiricus Hultén, with the grains relatively larger, about $\frac{2}{3}$ as long and at least half as large as the valves.

Further to the south, var. mexicanus (Meisner) C.L. Hitchc, with larger fruits, the valves 4-5 mm long, 3.5-4.0 mm wide.

2 X. R. Franktonis Boivin -- Hybrid of R. fennicus with R. salicifolius var. angustifolius. The stem tall, coarse and erect as in R. fennicus, but branchy and with numerous fascicles as in mexicanus. Leaves crisp, but often narrow. Valves triangular-ovate, entire or nearly so, subcordate at base. Grains small or insignificant, about 1 mm long, mostly 1-2 per fruit. Sterile or nearly so, but producing a fertile amphiploid. Local: Kindersly -- S.

3. R. FENNICUS Murb. -- (Patience, Doche) -- A tall virgate herb, its large and compact inflorescence much in evidence around sloughs towards the end of the summer. Stem 8-15 dm high, coarse, with a solid core, simple. Axillary fascicles poorly developed. Leaves few, large, strongly crip-margined, long cuneate at base. Valves entire or merely wavy-margined, (3)-4-(5) mm wide, short cordate, the base deeply cordate. Around mid summer or rarely earlier. Low places -- Y, Q-BC, US, Eur.

Perennial, but apparently able to flower the first year, hence probably its success as a weed. Spreading rapidly and still very local at the limits of its range: Dawson in Yukon, Thetford Mines in Quebec, Calgary and Writing on Stone in Alberta, Davie Lake in B.C.

4. *R. LONGIFOLIUS* DC. (*R. domesticus* Hartm.) -- (Patience, Doche) -- Much like *fennicus* in habit and other characters, but the valves larger, mostly 6-(8) mm wide, tending to be somewhat larger than long and rather reniform in outline. Stem often somewhat fistulose. Stem leaves commonly broader at base, usually broadly cuneate to cordate. Grains lacking or minute, may be 1/10 the width of the valve. Early summer. Recent and still rare weed of wet places: Austin, Virden, Yorkton. -- G, sAKa, NF-(SPM), NS-ecS, seBC, (US, Eur).

A report from Otterburne was based on a collection since revised by Dr. C. Frankton to *R. crispus*.

5. *R. occidentalis* Watson var. *occidentalis* (var. *fenestratus* AA.; *R. fenestratus* AA.) -- Habitally similar to *R. fennicus* etc., but the pedicel devoid of an articulation. Stem fistulose. Leaves cordate at base. Valves deltoid-ovate, entire to subdentate, quite grainless. Early summer. Sloughs and wet places. -- K-Y, Q-BC, US.

In our variety the valves are 4-6 mm long and the seeds 3-4 mm. In more maritime regions there occurs a large fruited and disjunct var. *labradoricus* Rech. f. (including var. *procerus* (Greene) J.T. Howell), its valves 6-8-(11) mm long, its seeds 4-5 mm long.

6. *R. CONFERTUS* W. (*R. Patientia* AA.) -- Leaves broadest, triangular-cordate, the blade shorter than the petiole. Basal leaves commonly 2 dm wide, the stem leaves similar but somewhat smaller and the upper longer than their petiole. Valves \pm 8mm wide, dentate, reniform, broader than long. Grains small or lacking, usually less than 1 mm wide. Early summer. Rare roadside weed: Ethelbert. -- Man, Eur.

Reports of *Rumex Patientia* L. in Canadian botany are generally to be discounted, especially the older ones. While it has been frequently reported from Nova Scotia to British Columbia, its actual Canadian range is apparently restricted to a few Ontario localities. We have verified specimens from Ottawa, Kingston, Salmon Pt., Woodstock and Napanee. All other Canadian collections checked turned out to belong to some other species, and all other unchecked reports are held as questionable pending checking of their vouchers.

7. *R. orbiculatus* Gray (*R. britannica* AA.) -- Yellow Dock, Pale Dock -- Also habitally similar to *R. fennicus*, but the valves grain-bearing and the pedicels without articulation. Stem fistulose, its leaves long cuneate at base, weakly dentate below the middle. Grains 2-3 mm long, borne on a stipe-like base \pm 0.5 mm long. Mid summer. Wet meadows and marshes in fresh water areas. -- (NF-SPM), NS-Alta, US.

A range extension by Henry 1915 to the lower Fraser in B.C. has never been confirmed and was ignored by Taylor 1966; it should be discounted as unsubstantiated. This and many other similar reports of various species by Henry may not be verifiable as his herbarium was reputedly destroyed by the executor of the estate.

8. *R. CRISPUS* L. -- Curled Dock, Sour Dock (*Patience sauvage*, *Reguette*) -- Again habitally similar to *R. fennicus*, but the valves with 3 grains of very unequal size. Stem nearly solid. At least the upper leaves truncate to cordate at base. Valves broadly cordate. Larger grain about 1/3 as wide as the valve, not at all stipitate. Second grain much smaller and the last minute. Just before mid summer. Ditches; tolerant of saline soils. -- (Y-Aka, L)-NF-(SPM), NS-Q-(O)Man-S-(Alta-BC, US, Eur).

9. *R. STENOPHYLLUS* Led. (*R. obtusifolius* AA.) -- Again habitally similar to *R. fennicus*, but the valves sharply dentate. Glabrous. Stem leaves broadly to narrowly cuneate at base. Inflorescence more open, partly moniliform. Valves deltoid, coarsely and sharply dentate, the teeth less than 1 mm long. Grains large, but one of them usually smaller than the other 2. All summer. Wet places, mostly ditches. -- sQ-swAlta, US, Eur.

The only report of *R. obtusifolius* L. from our area was based on Dore & Breitung 12552, Weyburn, 1950 (DAO, SASK). In 1964 this was revised by Dr. C. Frankton to *R. stenophyllum*. We concur.

10. *R. DENTATUS* L. -- Valves acicular-lobed like the following, but the branches glabrous and the pedicel with an articulation. Only 3-4 dm high and very branchy. Pedicels thick, shorter than the fruits. Grains 3, large. (Mid summer?) Rare weed of cultivated land: Lethbridge. -- swO, swAlta, Eur, (Afr).

Subdivided in 7 subspecies in the latest regional monograph. The paucity of specimens at hand allows neither an evaluation of these taxa nor a more accurate determination of our only collection.

11. *R. maritimus* L. (var. *fueginus* (Phil.) Dusén; *R. persicarioides* L.) -- Golden Dock -- Valves with 5-(7) acicular lobes. Branchy, 2-6 dm high. Short pubescent on the stem, branches and midnerves. Leaves \pm crisp-margined. Pedicels thin. Valves with lobes \pm 2 mm long, longer than the width of the undivided part of the blade. Summer. Common on shores and wet places, fresh or saline. -- (sMack)-Y-(Aka), NS-BC, US, (SA), Eur.

11 X -- *R. Alexidis* Boivin -- Hybrid of *R. stenophyllum*. Puberulent in the inflorescence and branchy in the manner of *R. maritimus*. Coarser, broader-leaved and with larger fruits, as *R. stenophyllum*. Valves 3-4 mm long, \pm 2 mm wide, the acicular teeth less than 2 mm long and very uneven in length. Local: Regina. -- S.

12. *R. ACETOSELLA* L. -- Sorrel, Redweed (*Petite Oseille*, *Surette*) -- Valves only marginally wider than the achene. Stoloniferous, dioecious, 1-4 dm high. Most leaves conspicuously hastate, otherwise entire. Outer sepals small, less than 1 mm long, but the valves up to 1.5 mm long. Summer. Occasional weed of acid soils -- G, Y-Aka, L-SPM, NS-BC, US, (CA, SA), Eur, (Afr, Oc).

13. *R. Acetosa* L. (*R. alpestris* (Scop.) Löve) -- Sweet-leaf, Sally Chives (*Oseille*, *Grande Oseille*) -- Outer sepals

tightly reflexed in fruit. Dioecious perennial, less than 1 m high. Stem leaves sagittate to \pm hastate at base. Sepals about 1 mm long in flower, enlarging to 2 mm in fruit, those of the male plants about 2 mm long. Valves entire, orbicular-reniform, with a minute and inconspicuous grain. Early summer. Sometimes cultivated and rarely escaping to roadsides; native to the alpine prairies of the Rockies. -- G, Mack)-Y-Aka, NF-SFM, NS-(PEI)-NB-BC, US, (SA), Eur, (Afr, Oc).

Native plants tend to larger basal leaves, those often cordate at base rather than sagittate or hastate. These tendencies are not sufficiently constant to enable us to implement a taxonomic distinction that would not rely heavily on the habitat or locus of collecting.

14. R. paucifolius Nutt. (R. pauciflorus sphalm.) -- Resembling R. Acetosa, but the leaves oblanceolate and long cuneate at base. Sepals of the male flowers 1.5-2.0 mm long, those of the female ones less than 1 mm long, spreading on the fruit. Valves cordate, grainless. Mid summer. High alpine; reported for the Rockies. -- (swAlta)-seBC, wUS.

4. OXYRIA Hill

Basic floral number is 2 while the rest of the family favors 3. Valves not winged and only slightly larger than the 2 outer sepals. Fruit winged.

1. O. digyna (L.) Hill -- Rhubarb, Mountain Sorrel -- Herb with reniform basal leaves. Stem leaf none or only one small one. The whole plant often bright red, especially the fruit wings. Sepals and valves oblanceolate to spatulate. Wings forming a near circular ring around the achene. Early to mid summer. Alpine and subalpine gravel slopes. -- G-Aka, L-NF, NS-Q, swAlta-BC, US, Eur.

5. RHEUM L.

Fruit 3-winged, subtended by 6 small sepals.

1. R. RHAPONTICUM L. -- Rhubarb, Pie-Plant (Rhubarbe) -- Huge, ovate rosette leaves with a succulent petiole. Forming large tufts. Inflorescence rather tall, whitish in flower. Fruits brownish. Early summer. Often cultivated and persisting indefinitely around abandoned homesteads. -- NB-S, BC, (US, Eur).

6. POLYGONUM L.

KNOTWEED

Basic type of the family. Fruit not winged, but surrounded by the persistent calyx of \pm 5 tepals.

- a. Stem with a ring of long, reflexed hairs at the nodes; usually climbing 20. P. cilinode
 aa. Nodes not specially pubescent.
 b. Climbing by twining stems.
 c. Fruit wingless 21. P. Convolvulus

- cc. With 3 broad wings 22. P. scandens
 bb. Not climbing.
 d. Flowers in panicles or corymbs.
 e. Flowers in axillary panicles..23. P. cuspidatum
 ee. Flowers in elongating corymbs at
 the end of the stem and branches.
 f. Seed smooth 24. P. Fagopyrum
 ff. Seed verrucose 25. P. tataricum
 dd. Flowers in axillary glomerules or in
 terminal racemes.
 g. Flowers solitary or in axillary
 glomerules Group A
 gg. Flowers all or mostly in leafless
 terminal racemes Group B

Group A

Flowers solitary or in numerous small axillary glomerules. Or the inflorescence sometimes becoming spiciform towards the end of the branches, but then at least the lower clusters conspicuously bracted. Ocrea deeply lacerate into mostly 2-3 lanceolate to linear lobes.

- a. Fruit reflexed or pendant on a recurved pedicel.
 b. Calyx 3-4 mm long8. P. Douglasii
 bb. Calyx 2.0-2.5 mm long; plants smaller.
 c. Leaves narrowly lanceolate to li-
 near 6. P. Engelmannii
 cc. Broader, the main ones oblanceolate
 to obovate 7. P. Austiniae
 aa. Fruit ascending or erect.
 d. Glomerules crowded towards the end of the
 branches into dense and leafy spiciform in-
 florescences.
 e. Leaves ovate to elliptic 5. P. minimum
 ee. Narrower, lanceolate to narrowly
 linear.
 f. Achene chestnut-brown 9. P. Kelloggii
 ff. Achene jet-black10. P. confertiflorum
 dd. Glomerules distant to scattered; some of
 the glomerules may be gathered in poorly
 defined and leafy, spiciform, terminal in-
 florescences.
 g. Calyx lobes about as long as the tube;
 leaves broad 3. P. achoreum
 gg. Lobes twice as long as the tube.
 h. Leaves rather large, the main ones
 1.0-2.5 cm wide, and very finely
 pencilled in white at the margin..2. P. erectum
 hh. Narrower and the margin green.
 i. Stiffly erect; flowers green-
 ish 4. P. ramosissimum

- ii. Normally depressed to decumbent; tepals with a broad white to red margin 4. P. aviculare

Group B

Flowers in well defined and leafless terminal racemes. Axillary glomerules also present in some species. Ocrea not lacerate, but more or less truncate at mouth.

- a. Leaves 1-3-(4); stem simple and bearing a single terminal raceme.
 b. Flowers replaced by bulblets in the lower part of the raceme 17. P. viviparum
 bb. Lacking bulblets 18. P. bistortoides
 aa. At least the leaves more numerous.
 c. Leaves broadly cordate 20. P. cilinode
 cc. Leaves broadly to narrowly lanceolate.
 d. Perennial with the erect branches usually simple and bearing only 1-(2) racemes 11. P. amphibium
 dd. Annual and branchy, with many racemes.
 e. Leaves deeply cordate at base ..
 19. P. sagittatum
 ee. Cuneate at base.
 f. Perianth abundantly glandular-punctate; racemes lax.
 g. Most stem-nodes with the ocrea distended or ruptured by a glomerule of enclosed cleistogamous flowers 16. P. Hydropiper
 gg. No axillary glomerules ..
 15. P. punctatum
 ff. Not punctate but glabrous or beset only with sessile glands; racemes dense.
 h. Main ocreae long ciliate; achene lenticular.... 12. P. Persicaria
 hh. Not ciliate; achene discoid.
 i. Achenes small; overtopped by the calyx lobes ..
 13. P. lapathifolium
 ii. Larger, at least the beak of the style protruding ..
 14. P. scabrum

1. P. ramossissimum Mx. (P. exsertum Small; P. interior Brenckle) -- Stiffly erect annual, resembling P. Douglasii, but the fruits \pm erect. Stem (3)-5-7-(10) dm high and quite branchy. Leaves lanceolate to linear, the main ones much larger, becoming much reduced towards the end of branches. Glomerules tending to form moniliform inflorescences towards the tip of the branches. Calyx green with paler margins. Outer sepals

obviously longer than the inner. Achene purple-brown. Mid summer. Shores and wet meadows. -- (Y-Aka), NS-O-(Man)-S-Alta-(BC, US).

2. *P. erectum* L. -- Erect or decumbent and rather coarse, resembling the last, but the leaves broad, even broader than the next. 5 dm high or more and the fairly abundant foliage rather light green. Leaves elliptic to elliptic-lanceolate, very finely crenulate and very finely pencilled in white at the margin. Calyx deeply lobed and mostly yellowish white at margin. Mid to late summer. Shores and other exundated places. -- Aka, NF, PEI-Man-(S-BC), US.

3. *P. ACHOREUM* Blake -- Calyx not so deeply divided, the tube about as long as the lobes and reaching slightly beyond the broadest part of the achene. Resembling the following, but coarser, not so depressed and rather decumbent with ascending tips. Leaves rather broad, obovate to oblong, about twice as long as broad, the main ones commonly around 1 cm wide. Flowers greenish. Summer and fall. Around buildings and along roadsides, at least since 1880. -- Mack-Aka, NB-BC, US.

Paler green and broader-leaved than *P. aviculare*, it tends to branch, when not tramped too much, into a globose mass reminiscent of the Rolling Mustards. We do not know if it actually behaves like a Rolling Mustard in late fall. It is especially in evidence at the edge of newly graded highways where it is often the most conspicuous and abundant pioneer. We find this entity to be quite readily distinguished from *P. aviculare* and we must admit of some puzzlement over the frequency of misidentifications, some by leading taxonomists. In one such case Fernald, *Rhodora* 52: 18, 1950, reported *P. achoreum* occurring as a native on the shores of the Bay of Fundy. This being the only report of the species for the province, the justifying sheet was borrowed for study and it turned out to be a specimen of *P. aviculare sensu lato*, one of those seacoast specimens one might have expected Fernald to identify as *P. Fowleri* or *P. boreale*.

4. *P. AVICULARE* L. (var. *angustissimum* Meisner, var. *littorale* (Link) W.D.J. Koch; *P. boreale* (Lange) Small; *P. buxifor-me* Small; *P. caespitosum* A. & G.; *P. Fowleri* Rob.; *P. heterophyllum* Lindman; *P. neglectum* Besser; *P. ovalifolium* Lehm.; *P. prolificum* (Small) Rob., var. *autumnale* Brenckle) -- Knotweed, Doorweed (*Trainasse*, *Herbe à cochons*) -- A common and exceedingly variable species, often subdivided into a series of microspecies. Creeping to suberect annual. Leaves broadly to narrowly oblanceolate, usually less than 1 cm wide. Calyx lobes with a broad white to pink or red margin. Achene greenish brown to chestnut brown. Early summer to frost. Open to semi-open ground, especially in barnyards and tramped places. -- (G), seK-Aka, L-SPM, NS-BC, US, Eur, (Oc).

Highly variable, highly plastic and responding most readily to ecological conditions; especially tolerant of tramping, even of excessive tramping. Treatments of this species vary greatly from author to author and some will recognize up to 20 segregates. We find that the 3 segregates that precede are reasonably

distinct, but we are not convinced that further splitting is justified within the Canadian material. We are especially dubious of characters of size of achenes as these obviously vary greatly in any area, with late season specimens tending to produce longer achenes, and the odd specimen bearing some unusually large achenes. As pointed out by one author, accurate determinations of heterophylly can be made only in young well grown plants. This means that with most herbarium specimens one has to start by guessing either at the heterophylly or at the fruit size if an attempt is to be made at recognizing segregates of *P. aviculare*. The most commonly recognized segregate is *P. Fowleri*, a seashore type said to range along the northern seacoasts from Maine, to Washington State. We have studied an extensive series of specimens so determined or verified by various specialists of the group and we have been unable to detect any consistent difference, other than the seashore habitat, between these plants and the rest of *P. aviculare*.

5. *P. minimum* Watson -- Small annual species with rather large leaves. Up to 1.5 dm high, often branched from the base. Main stem nodes elongate, but most leaves and flowers crowded at the tip of the branches. Leaves less than 1 cm long, ovate to oblong. Summer. Dry hillsides and rocky outcrops in the Rockies. -- swAlta-BC, wUS.

6. *P. Engelmannii* Greene -- Similar to *P. Douglasii*, but smaller. Less than 2 dm high and usually very branched from the base. Leaves narrow and tepals small. Summer. Disturbed soils; rare: Waterton, Pincher Creek, Livingstone Gap. -- swAlta-(seBC), wUS.

7. *P. Austiniae* Greene -- Resembling the preceding, but the leaves broader, the main ones oblanceolate to obovate or spatulate. Around 1 dm high. Tepals with a broad white margin. Summer. Disturbed soils in the mountains. -- swAlta-sBC, wUS.

8. *P. Douglasii* Greene var. *Douglasii* -- Fruits reflexed to pendant. Stiffly erect annual (1)-3-(7) dm high. Leaves lanceolate to narrowly linear. Flower mostly solitary, mostly borne in the axil of reduced upper leaves and tending to form very lax spiciform inflorescences. Summer. Dry hillsides and rocky outcrops. -- swQ-BC, US -- Var. *latifolium* (Eng.) Greene-- Main leaves broader, commonly oblong-lanceolate to lanceolate, mostly about 1 cm wide. Tending to replace the typical phase in the mountains: Cypress Hills and Rockies. -- swS-swAlta-sBC, (wUS).

9. *P. Kelloggii* Greene (*P. Watsonii* Small) -- Achene chestnut brown. Small erect annual less than 1 dm high. Glomerules mostly aggregated towards the tip of the branches into very leafy inflorescences. Upper bracts sometimes narrowly white-margined in the manner of the following species. First half of summer. Exsiccated places: Cypress Hills, Redcliff. -- swAlta-(swBC), wUS.

The Cypress Hills collection was by Macoun in 1880 (QK; DAO, photo). No further precision was available on the place of origin of this specimen and no modern collection has been

made that could provide further information.

10. P. confertiflorum Nutt. -- Much like the preceding, but most of the inflorescence bracts with a conspicuous white margin. Achenes jet black. Early summer. Exsiccated places. Rare or overlooked: Bélanger. -- swS-(Alta-BC, US).

11. P. amphibium L. var. amphibium (var. Hartwrightii (Gray) Bissell, var. stipulaceum (Coleman) Fern., f. fluitans (Eaton) Fern., f. hirtuosum (Farw.) Fern.; P. natans Eaton, f. Hartwrightii (Gray) Stanford; Persicaria fluitans (Eaton) Greene; Persicaria nebraskensis Greene; Persicaria psychrophila Greene) -- Lakeweed, Red Shanks -- Stoloniferous perennial, submerged to terrestrial. A rather coarse herb, hirsute to glabrous. Leaves oblong-lanceolate to linear-lanceolate, broadest near the middle. Spike 1-5 cm long, pinkish red, terminal and normally solitary. Mid summer. Muddy shores and shallow waters. -- Mack-Y-(Aka, L-NF)-SPM, NS-BC, US, Eur -- Var. emersum Mx. (P. coccineum Muhl., f. natans (Wieg.) Stanford, f. terrestre (W.) Stanford, var. pratincola (Greene) Stanford, var. rigidulum (Sheldon) Stanford; P. Muhlenbergii Watson; Persicaria coccinea (Muhl.) Greene; Persicaria mesochora Greene; Persicaria Muhlenbergii (Watson) Small; Persicaria pratincola Greene; Persicaria rigidula (Sheldon) Greene) -- Leaves narrowly ovate-lanceolate, broadest near the base, more acuminate. Spike usually longer, up to 4-10 cm long and elongate-cylindric. -- Mack, NS-BC, US.

Most current floras will subdivide our plant in two species and even further into a more or less elaborate series of varieties and forms. The specific distinction is based on the leaves being more acuminate, the peduncles pubescent and the spike longer. On the basis of the material at hand, the peduncle pubescence is not linked to the leaf form or spike length, but to the water level; it appears to be an ecological character. The spike length is not a discontinuous character, it is only an extreme of variation and is readily detectable only in late season. Similarly the leaf shape is only an extreme of variation and is to be recognized readily only on vigorous and emersed plants. Both extremes are weakly linked and neither occurs in the eurasian specimens examined; they appear to characterize a weak geographical variation. Other characters studied did not appear to be in any way significant.

In a normally amphibious species, floating and emersed forms are part of the normal variation and are not deemed worthy of taxonomic designation.

12. P. PERSICARIA L. -- Heart's Ease, Black Heart (Fer à cheval, Pied rouge) -- Resembling the following but the ocrea with the nerves long excurrent in the form of long and stiff cilia. Leaves often with arrowhead-shaped purple blotch above, not punctate below, but glabrous to lightly scabrous. Ocrea pubescent with flexuous and partly adnate hairs. Inflorescence glabrous or sometimes somewhat glandular. Racemes usually pink. Achene 2 mm wide or less, slightly concave on one side, convex on the other, usually overtopped by the calyx lobes. Summer and

early fall. Infrequent weed of disturbed soils. -- (G, Y)-Aka, L-NF-(SPM), NS-BC, US, Eur.

13. P. lapathifolium L. (var. salicifolium Sibth.; P. Persicaria L. var. lapathifolium (L.) Meisner; Persicaria incar-nata (Ell.) Small; Persicaria lapathifolia (L.) S.F. Gray) -- Leaves glandular-punctate in yellow underneath. Annual, usually erect, with \pm lanceolate leaves. Ocrea eciliate and glabrous, or the lowermost and uppermost very short-ciliate. Leaves glabrous below. Racemes normally pink. Inflorescence glabrous or sometimes glandular. Achene small, 1.5-2.0 mm wide, ovetopped by the calyx lobes, more flattened than in the preceding, discoid and concave on both sides. Mid summer. Wet places, mostly exsiccated. -- (G, Mack), Aka, (NF-SPM), NS-Alta-(BC), US, Eur.

The Scoggan 1957 report of P. pensylvanicum L. from our area was based on a sheet, E. Scamman 2878, Clear Lake, 1941 (GH), which we have since revised to P. lapathifolium. A report by Löve 1959 of Persicaria pensylvanica (L.) Gomez f. albinea (Farw.) Löve & Bern. was also based on a sheet (MSM; DAO, photo) similarly revised since to P. lapathifolium.

14. P. SCABRUM Moench (P. tomentosum Schrank; Persicaria incana (F.W. Schmidt) S.F. Gray; Persicaria tomentosa (Schrank) Rickn.) -- Much as in the preceding but the racemes usually pale green. Leaves punctate and glabrous to lightly tomentose below. Inflorescence very glandular. Achene \pm 2.5 mm wide, discoid and concave on both faces, usually somewhat protruding between the tips of the calyx lobes. Summer. Common weed of crops and disturbed soils. -- (Mack), Aka, (L)-NF, NS-(PEI-NB)-Q-BC, (US, Eur).

15. P. punctatum Ell. var. confertiflorum (Meisner) Fassett (var. leptostachyon AA.) -- Racemes lax and somewhat drooping at tip. Otherwise with the general habit of P. Persicaria and the ocrea similarly long-ciliate. Axillary glomerules lacking. Ocrea strigose with stiff and half adnate hairs. Raceme irregularly moniliform. Perianth green with white margins. Second half of summer. Wet places and shores. -- NS-ecS, sBC, US, (CA).

Our variety is annual while the typical variety is perennial and its leaves are often larger.

Our plant has also been called var. leptostachyum (Meisner) Small, but this is an illegitimate name and further it is based on a javanese variant, not on our cisatlantic phase.

16. P. Hydropiper L. (var. projectum Stanford) -- Smartweed, Water-Pepper (Gurage, Poivre d'eau) -- Both terminal racemes and axillary glomerules present. Otherwise much as in the preceding. Axillary glomerule more or less included in the ocrea. Perianth white-margined or more commonly pinkish. Late summer. Shores: Red River. -- (Aka, NF-SPM), NS-(PEI-NB)-Q-Man, BC, US, Eur, (Afr, Oc).

17. P. viviparum L. var. viviparum -- Bistort, Serpent-Grass (Petite bistorte) -- Raceme with a large proportion of the flowers replaced by fleshy bulblets, the remaining flowers sterile. Tufted perennial. Stem 1-3 dm high, stiffly erect,

simple, mostly with only 1 leaf. Leaves lanceolate to linear, usually pilose below. Inflorescence linear, whitish, less than 1 cm wide. Early to mid summer. Wetter spots in arctic and alpine prairies. -- G-Aka, L-SPM, Q-nMan-nS-BC, US, Eur.

A Saskatchewan report for lake Athabaska by Breitung 1957 is credited to Raup 1936. But the latter cites only Alberta and Mackenzie collections. Our Saskatchewan report is based on a Lake Hansen collection (DAO).

Along southern Alaska occurs a var. Macounii (Small) Hultén, coarser and with a smaller calyx.

18. P. bistortoides Pursh -- Similar to P. viviparum, but not bulbiferous. About twice taller with mostly 3 stem leaves. Raceme oblong, 1.5-2.5 cm wide. Early summer. Montane prairies: Cypress Hills and Rockies. -- sAlta-(eBC), wUS.

19. P. sagittatum L. -- Arrow-Vine, Tear-Thumb (Grathecule) -- Stem and branches very rough and very catchy because of lines of very small and recurved prickles. Climbing on surrounding vegetation. Leaves sagittate-lanceolate, prickly along the mid nerve. Flowers in terminal capitate racemes. Second half of summer. Wet open places. -- NF-SPM, NS-Man, US, (Eur).

20. P. cilinode Mx. (Bilderdykia cilinodes (Mx.) Greene) -- Bindweed -- An erect native perennial with deltoid-hastate leaves. Stem reflexed-puberulent, not infrequently twining at tip. Leaves hastate at base, acuminate at tip. Inflorescence a panicle of lax racemes. Early summer. Open sands and granite outcrops. -- (NF), NS-cS, US.

Macoun 1886 reports it from the Lesser Slave Lake, but in 1964 we leafed through subgenus Tiniaria at CAN without finding a justifying specimen. To our knowledge this species does not extend west of Lac La Ronge.

21. P. CONVULVULUS L. (Bilderdykia Convolvulus (L.) Dum.) -- Bindweed, Black Bindweed (Chevrier, Vrillée sauvage) -- Annual weed with twining stems. Leaves deltoid-hastate. Stem minutely scabrous in lines. Flowers either in axillary clusters or mostly in interrupted racemes borne on long axillary pedicels. Summer. Frequent weed of cultivated fields and waste places. -- G, Mack-Aka, L-SPM, NS-BC, US, Eur, (Afr, Oc).

22. P. scandens L. var. scandens (var. dumetorum AA.) -- False Buckwheat, Wild Buckwheat (Vrillée bâtarde) -- Similar to the previous two but the fruit much larger and with 3 conspicuous wings. Perennial with twining stems, the latter glabrous and smooth or nearly so. Leaves similar to the previous two. Flowers in interrupted and bracteolate axillary racemes. Fruit 9-15 mm long, measured from the articulation, the body only 6-10 mm long, with wings arising from the midnerve of the 3 outer tepals. Second half of summer. Shores. A rare native in southern Manitoba, or perhaps only a weed with us. -- (NF), NS-sMan-swS-cAlta-(seBC), US.

In var. dumetorum (L.) Gleason the fruit is somewhat smaller, not exceeding 10 mm if measured from the articulation, the body \pm 5 mm long. Reputedly, this paleogean var. dumetorum is naturalized at a number of places in North America, but all

New World specimens examined have been revised to var. scandens.

23. *P. CUSPIDATUM* Sieb. & Zucc. -- Japanese Knotweed, Horse-Buckwheat (Jérusalem) -- Tall coarse herb with large nearly round leaves, truncate at base, abruptly short-acuminate. Up to 3 m high. Leaves about 1 dm long. Flowers in axillary panicles. Fruit similar to *P. scandens*. End of summer. Sometimes cultivated and often persisting indefinitely, more rarely spreading to adjacent fields: Winnipeg. -- (Aka), NF, NS-Man, swBC, neUS, eEur.

There is an earlier *P. cuspidatum* W., but the latter is only a nomen nudum and its existence does not proscribe the present usage. See Merrill in *Rhodora* 40: 290-1, 1938.

24. *P. FAGOPYRUM* L. (Fagopyrum esculentum Moench; F. sagittatum Gilib.) -- Buckwheat (Sarrazin, Blé noir) -- Leaves deltoid, cordate at base, somewhat acuminate at tip. Annual. Flowers commonly white, in ± corymbose clusters that will often elongate in fruit to become somewhat racemose and irregularly interrupted. Tepals about half as long as the achene. Summer. Crop plant which sometimes reappears a second year or as an impurity in cultivated fields. -- NF, (NS)-PEI-Q-(Man)-S, US, Eur.

25. *P. TATARICUM* L. (Fagopyrum tataricum (L.) Gaertner)-- Buckwheat, Tartary-Buckwheat (Sarrazin de Tartarie, Fagré)-- Seeds coarsely and irregularly undulate-verrucose, especially on the angles. Flowers somewhat smaller and usually greenish, the tepals 1.5-2.0 mm long. Otherwise much as in the preceding. Summer. Rare impurity in crops or a roadside weed. -- (NF, NS), NB-Q-(Man)-S-Alta, (US), Eur.

77. ILLECEBRACEAE (ILLECEBRUM FAMILY)

Reduced type from the Caryophyllaceae, the fruit being reduced to a 1-seeded utricle. Leaves opposite, etc., but the petals lacking as in the Polygonaceae.

- a. Stipules conspicuous 1. Paronychia
 aa. Lacking 2. Scleranthus

1. PARONYCHIA Miller WITLOW-WORT

Herbs with conspicuous stipules and generally resembling the Caryophyllaceae. Petals lacking.

1. *P. sessiliflora* Nutt. (*P. depressa* AA.) -- Cushion-forming species with membranous stipules mostly longer than the leaves. Puberulent. Leaves stiff, with spinescent tips. Sepals cucullate above and ending in a deflexed spinescent tip. Not particularly conspicuous at flowering. First half of summer. Dry hills. -- sS-sAlta, US.

Not to be confused with Phlox Hoodii of similar habit. The latter lacks the numerous, large and transparent stipules.